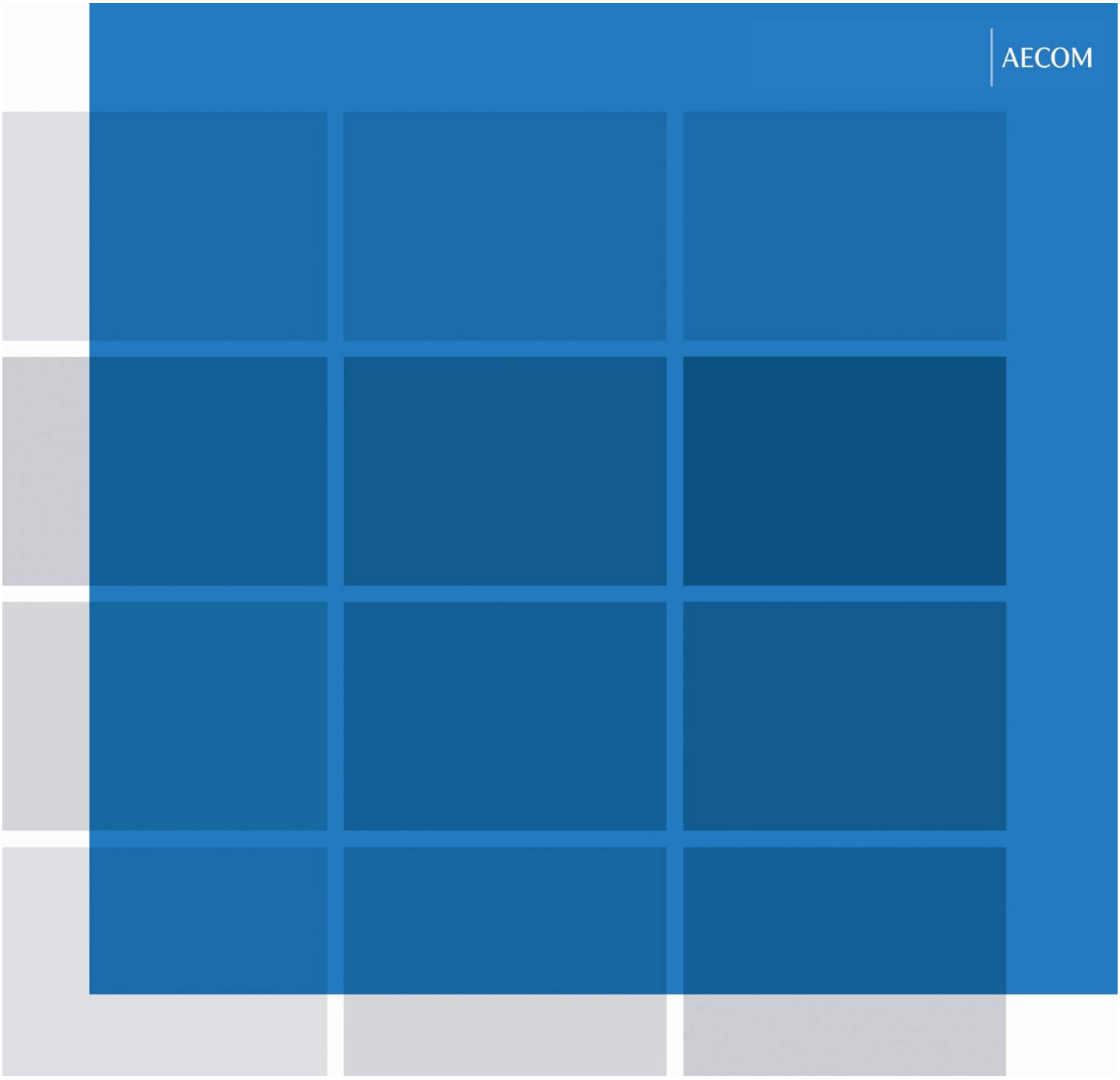
Appendix 7.8 Bat Survey Report



Morpeth Northern Bypass
Bat Survey Report

Northumberland County Council
October 2008

Prepared by: ..... Approved by:

Jennifer Davis
Ecologist

Lorraine King
Associate Director

Emma Grubb
Graduate Ecologist

Error! Reference source not found.

Rev No	Comments	Date
0	Internal checking only	19/12/08
1	Internal checking only	08/01/09
2	Submission to the client	12/01/09

5th Floor, 2 City Walk, Leeds, LS11 9AR
Telephone: 0113 391 6800 Fax: 0113 391 6899 Website: http://www.fabermaunsell.com

Job No 53101ILEE Reference RE10 Date Created October 2008

Table of Contents

Introduction

1 Introduction

1.1 Introduction to the Scheme

1.1.1 Faber Maunsell were commissioned by Northumberland County Council to undertake ecological surveys at the location of the proposed Morpeth Northern Bypass, Morpeth, Northumberland. Morpeth lies approximately 16.2 miles north of Newcastle-upon-Tyne, with the general site location shown on Figure 1 - Site Location Plan.

1.1.2 The proposed single carriageway bypass will be located to the north of Morpeth town centre and will link the A192 (Pottery Bank) to the B1377 (Whorral Bank). The bypass is required to remove a significant portion of traffic from Morpeth town centre, thereby easing congestion as well as facilitating the regeneration of North Seaton, Camois and Blyth areas. The route is shown on Figure 2 – Proposed Bypass Route, starting at approximate National Grid Reference (NGR) NZ 184872 and finishing at approximate NGR NZ 211873. The proposed bypass runs through an area that predominantly comprises improved grassland (grazed) and arable land bounded by primarily species-poor intact hedgerows and fences.

1.1.3 An initial Ecological Walkover Survey was undertaken in March 2007 as part of an Environmental Assessment (Faber Maunsell, April 2007) of the scheme. This highlighted that the area of the proposed route of the Morpeth Northern Bypass may provide some habitat suitable for bats. For example, several woodland areas are present adjacent the route which were considered to offer potential habitat for bats. These are:

- Along Kater Dean, south east of Northgate Hospital.
- Along Cotting Burn
- Surrounding Fulbeck Grange Ambulance Station - Cotting Wood Site of Nature Conservation Importance (SNCI).
- Howburn Wood – Site of Nature Conservation Interest (SNCI), Ancient Replanted Woodland (ARW) and Ancient Semi-Natural Woodland (ASNW).

1.1.4 A bat survey was required to determine the presence/absence of bat roosts and the extent of bat activity within 250m of the proposed bypass route, referred to as the Survey Area (see Figure 2 – Proposed Bypass Route). An assessment of any potential impacts which may result from the construction of the proposed bypass can then be undertaken, with mitigation recommended to minimise any impacts.

1.1.5 The report is based on information obtained from an Ecological Data Search and the results of the Bat Survey commissioned specifically for this Bat Report.

1.1.6 The report is arranged as follows:

- Section 2 provides **Background** information and legislation relating to bats.
- Section 3 details the **Methodology** for the Ecological Data Search and Survey, as well as the Impact Assessment Methodology.
- Section 4 describes the **Results** of the Ecological Data Search and Survey.
- Section 5 discusses the **Impacts** of the construction of the proposed bypass.
- Section 6 discusses **Mitigation** to minimise any impacts.
- Section 7 provides a **Summary** of the report and its findings.

FABER MAUNSELL | AECOM

Background

2 Background

2.1 Background to Bats

2.1.1 There are 17 bat species resident in Britain. They roost in a variety of places such as caves, mines, trees and buildings. Woodlands, pasture, ponds and slow flowing rivers or canals provide suitable habitat for feeding bats as they support an abundance of insect life. Bats tend to feed during the first two to three hours after sunset and again before dawn, when insect activity is at its most intense.

2.1.2 Bat activity over the course of a year reflects the seasonal climate and the availability of food as follows (The Bat Conservation Trust, undated):

- January - March
  - Insect prey is scarce and bats will hibernate alone or in small groups.
- April – May
  - Insects are more plentiful and bats will become active. They may become torpid (cool and inactive) in bad weather. Females will start to form groups and will roost in several sites.
- June – July
  - Females gather in maternity roosts and give birth to young, which are suckled for several weeks. Males roost alone nearby.
- August – September
  - Mothers leave the roost before the young. Bats mate and build up fat for the winter.
- October – December
  - Bats search for potential hibernacula. They become torpid for longer periods and then hibernate.

2.1.3 Bats do not stay in the same roost throughout the year. They have different requirements of roosts at different times of the year. For instance, in summer they require warm roosts when the females are producing young and in the winter they require cold roosts in order to conserve their energy. Summer roosts may be occupied between April and October, with peak activity from May to September. The remaining part of the year is a hibernation period.

2.1.4 The several different types of roost which bats occupy throughout the year are as follows:

- Daytime summer roosts
  - Usually cool and secluded and are where bats wait for their next feeding opportunity.
- Nursery/maternity roosts
  - Where young are born and are usually quite warm. Young spend their first few weeks here before they become independent.
- Temporary night roosts
  - Used for shelter nearer to feeding areas if the weather is bad. They are also used for short periods between dusk and dawn to save returning to the main roost.
- Mating roosts
  - Set up by the males, where they attempt to attract females for mating.
- Hibernacula
  - Roosts in which bats hibernate over winter. These have to be cold and free from any temperature fluctuation. The coldness enables bats to lower their body temperature and become torpid. This saves a lot of energy, enabling them to survive on the fat stores within their bodies that they have built up throughout the summer.

2.1.5 The biggest threats to bats include habitat loss (e.g. deforestation), loss of feeding areas as a result of modern forestry and farming practices, use of toxic agrochemicals and remedial timber treatment chemicals and disturbance to bat roosts.

2.1.6 Bats have been in decline both nationally and internationally during the latter part of the 20th century. It is thought that their physical attributes, reproductive strategies and lifestyles render them particularly vulnerable to environmental change (Cowan, 2003). Bats require a variety of specific habitats in order to meet the basic needs of feeding, breeding and hibernating and are therefore extremely vulnerable to change such as:

- The loss of flight lines through the removal of hedgerows as some species will not cross open areas.
- A reduction in insect prey abundance, due to high intensity farming practice and inappropriate riparian management.
- Loss of insect-rich feeding habitats and flyways, due to loss of wetlands, hedgerows and other suitable prey habitats.
- Loss of winter roosting sites in buildings and old trees.
- Disturbance and destruction of roosts, including the loss of maternity roosts due to the use of toxic timber treatment chemicals

However, there is a lack of information on their population dynamics and the relative impact of the factors causing their decline nationally (Cowan, 2003).

2.2 Legal Framework

2.2.1 All European bats are listed in Annex IV of the EC Directive 92/94/EEC 'The Conservation of Natural Habitats and of Wild Fauna and Flora' as being in need of "strict protection". This is implemented in Britain under Regulation 39 of the Conservation (Natural Habitats, & c.) Regulations 1994 as amended. British bats are included under Schedule 5 of the *Wildlife & Countryside Act*, 1981, and the whole of Section 9 applies to European bat species. In summary, the above legislation prohibit the following:

- Deliberately capture, injure or kill a bat.
- Deliberately disturb in a way that would significantly affect their local distribution or abundance, or affect their ability to survive, breed or rear young.
- Damage or destroy a breeding site/resting place or intentionally damaging a place used for shelter (this applies to sites that are not currently occupied, as bats can return to roosts year after year).
- Damage or obstruct access to any place that a bat uses for shelter or protection (i.e. a roost) without a licence.
- Possess, control, transport, sell, exchange or offer for sale/exchange any live or dead bat or any part of a bat.

2.2.2 Natural England is the Government body responsible for nature conservation. Local Planning Authorities must consult them before granting planning permission for any work that would be likely to result in harm to the species or its habitat. Natural England issue licenses to allow works to be carried out within the law.

2.2.3 "Development" licences are issued by Natural England for any actions that may compromise the protection of a European protected species, including bats, under the Conservation (Natural Habitats, &c.) Regulations 1994. This includes all developments and engineering schemes, regardless of whether or not they require planning permission.

Non Statutory Policy

2.2.4 Seven of our seventeen species of bat have been identified by the UK Government as needing special conservation help because of their rarity or because their absolute numbers have declined alarmingly in this century.

2.2.5 In 2007, a new UK Priority List for species of the UK Biodiversty Action Plan (UK BAP) was created and new additions to this list are noctule (*Nyctalus noctula*), brown long eared (*Plecotus auritus*) and soprano pipistrelle (*Pipistrellus pygmaeus)*. Due to their recent inclusion on the UK Priority List, Species Action Plans for these species have not yet been prepared.

2.2.6 Species Action Plans (SAPs) – i.e. plans to promote the species and their habitats to maintain and enhance their existing population numbers have been, or will be, prepared for the following seven species:-

- Greater horseshoe (*Rhinolophus ferrumequinum*)
- Lesser horseshoe (*Rhinolophus hipposideros*)
- Bechstein (*Myotis bechsteini*)
- Barbastelle (*Barbastella barbastellus*)
- Soprano pipistrelle (*Pipistrellus pygmaeus*)
- Brown long eared (*Plecotus auritus*)
- Noctule (*Nyctalus noctula*)

2.2.7 From the seven species of bat identified as needing special conservation assistance, three species - the soprano pipistrelle, brown long eared and noctule - are known to be present in Northumberland.

2.2.8 The common pipistrelle and soprano pipistrelle have only been recognised as a separate species since the mid 1990s, resulting in problems of estimating population trends of each species. The information given in 2.2.10 on pipistrelle bats therefore relates to both species.

2.2.9 Although it remains the most abundant and widespread bat species in the UK, the pipistrelle is thought to have undergone a significant decline in numbers this century. Estimates from the National Bat Colony Survey suggest a population decline of approximately 70% between 1978 and 1993. The current pre-breeding population estimate for the UK stands at approximately 2,000,000.

2.2.10 All bat species present in the Northumberland region (see 4.1) are listed as priority species in the Northumberland Local BAP. The main target of the BAP are listed as:

- Maintain the current population of bats in Northumberland by 2010
- Maintain the current range of bats in Northumberland by 2010

2.2.11 In order to achieve these targets, 17 priority actions have been identified, 2 of which are relevant to the proposed bypass scheme:

- Prevent where possible, or mitigate against, any roost loss or habitat loss or fragmentation (including commuting roosts).
- Require habitat enhancement as planning gain for all developments that adversely affect bat roosts.

FABER MAUNSELL | AECOM

Methodology

3 Methodology

3.1 Overview

3.1.1 The bat assessment at Morpeth comprised the following elements:

- A desk-based ecological data search to gather historical bat records and crudely assess the potential bat habitat of the Survey Area using maps/photos.
- A day-time bat habitat assessment to assess in detail the suitability of the site for bats, looking at individual trees and hedgerows. This information is then used to inform the night-time surveys.
- Evening transect surveys (to determine the main areas of bat activity) and dusk/dawn surveys at potential roost sites (including both trees and buildings).

3.1.2 The methodologies for each of these components are described below.

3.2 Ecological Data Search

3.2.1 A number of conservation organisations, local naturalist groups and individuals were contacted to obtain bat data for the site and 2km surrounding the Survey Area.

3.2.2 The following relevant consultees were contacted:

- Northumbria Mammal Group
- Northumberland Bat Group
- Northumberland Wildlife Trust
- Natural England
- Environment Agency
- The EYE Project (Exploring Your Environment)

3.2.3 The bat data obtained has been taken into account when assessing the potential impacts of the development on the species and when formulating any necessary mitigation measures, which can be implemented to help reduce the impacts.

3.2.4 Additional information was obtained from the following sources, with a full list of literature reviewed as part of the assessment provided in the References section:

- Google Earth online satellite images http://earth.google.com was used to search aerial images of the site and surroundings.
- UK BAP website (http://www.ukbap.org.uk/default.aspx) was consulted to obtain information regarding the bat BAPs.
- Northumberland Biodiversity Partnership website (http://www.northumberlandbiodiversity.org.uk/) was consulted to obtain information regarding the local bat BAPs.

3.3 Day-Time Field Surveys

Bat Habitat Assessment

3.3.1 A day-time assessment of the habitat of the Survey Area was undertaken on 30th July 2008 to assess the suitability of the site to provide roosting and foraging habitat. The Survey Area is defined by a 250m buffer zone around the proposed bypass route as shown in Figure 2 – Proposed Bypass Route.

3.3.2 A daytime walkover of the site was conducted to assess the bat roost potential of all trees within the Survey Area. The following features may increase a trees likelihood of supporting a bat roost:-

- Trees that contained a cavity or space of at least 10mm.
- Woodpecker holes, rot holes, cavities, loose bark and ivy..

- Tree diameter at chest height of > 20cm (less indicates that bats are less likely to be present).
- Trees > 80 years of age are more likely to be attractive to bats as they are more likely to have developed suitable cracks and crevices.

3.3.3 The daytime survey also included a search for positive signs of bat use, such as:

- Droppings and urine spots found in or around trees. When identified they can confirm presence of roosting bats.
- Scratch and grease marks - these are often left by bats entering and emerging from roosts.
- Bat calls – although bats are nocturnal, they can often still be heard making social calls on a bat detector when within their roosts.

3.3.4 The Habitat Assessment also considered the buildings within the Survey Area, their proximity to the proposed bypass route and their potential to support bat roosts. The potential of buildings to support a bat roost was based on an external visual assessment rather than a detailed internal and external inspection. It was considered that this depth of assessment is appropriate to the early stage of the overall assessment, however detailed external and where appropriate internal inspections should be undertaken as part of future assessments and prior to demolition of any structure with bat roost potential.

3.3.5 An assessment of hedgerows present in the Survey Area was also undertaken during the Bat Habitat Assessment to assess their quality as potential flight lines for bats. Criteria used to determine quality of flight lines included height, width, density of hedge, and connectivity to other potential flight lines.

3.4 Night-Time Field Surveys

Transect Surveys

3.4.1 Manual transect bat surveys help gain an understanding of how bats use an area and are used to determine the intensity of bat activity (spatially and temporally) and the type of activity, such as foraging (feeding buzzes), commuting (high direct pass rates) or returning or emerging from roosts.

3.4.2 The objectives of the transect surveys were:

- To determine the potential effect development proposals would have on bat species present.
- To determine the area and value of habitat for bat species.
- To identify links to potential high value habitats outside of the development area.
- To determine if the Survey Area is a corridor or contains corridors of importance for commuting bats.

3.4.3 The transect routes took account of the most suitable areas for bat activity, concentrating on features and habitat that were likely to be used by bats such as:

- Hedgerows.
- Tree lines – areas of broadleaved and coniferous woodland and plantation.
- Watercourses including ditches, streams and rivers.

3.4.4 Within the Survey Area, 5 transects were devised with a total of 20 stopping points located in the vicinity of the proposed bypass route (Figure 3 – Bat Survey Areas). The transects devised for the activity survey followed a set route so that they may be repeatable and comparable between each survey visit. Routes were chosen according to the following criteria:

- Ability to cover the route of the proposed bypass.
- Connected and concentrated on areas of good foraging and roosting habitat.
- Each stopping point was located at potential flightline crossing points of the proposed bypass route (such as hedgerows, watercourses, woodland).

3.4.5 The first transect surveys were undertaken between 30th July and 1st August 2008, and repeated between 23rd and 26th September 2008.

3.4.6 Surveys were undertaken in accordance with guidance within the "Bat Surveys Good Practice Guidelines" (Bat Conservation Trust, 2007). Surveys were therefore undertaken in calm, dry weather conditions when temperatures were >10^{o}C ensuring optimum foraging activity.

3.4.7 Transects were started 30 minutes prior to sunset and continued for 1.5 to 2 hours after sunset. This ensured that both late and early emerging bat species may be recorded. Each transect was walked by two surveyors, walking at a slow, constant pace, with stops made at listening points for 5 minutes.

Building Surveys

3.4.8 Surveys of buildings aim to determine:

- Whether bats are using buildings/structures as roosts.
- What species of bat are present on the site.
- The population number of bats roosting at the site.
- Whether the surrounding area is used as commuting/foraging habitat.

3.4.9 A total of 7 groups of buildings were surveyed. All buildings surveyed either lie within the footprint of the development, and therefore may be demolished, or lie in close proximity to the development footprint and therefore may be significantly affected by the development. Buildings surveyed are shown on Figure 3 – Bat Survey Areas. For the purpose of this survey the buildings were referred to as:

- Rose Cottage
- East Lane End
- Buildings to the north of East Lane End
- East Shield Hill North
- East Shield Hill South
- Kater Dene
- West Lane End

3.4.10 The majority of building surveys were carried out at dawn. The reason for this is that it is easier to see bats entering roost areas rather than leaving them. This is due to light levels and also because bats tend to swarm around a roost entrance for a few minutes before entering it whereas when bats leave a roost, they fly straight out and away to forage.

3.4.11 The dawn surveys commenced between 1.5 to 2 hours before sunrise and finished at sunrise, or shortly afterwards. Surveys were undertaken in accordance with guidance within the "Bat Surveys Good Practice Guidelines" (Bat Conservation Trust, 2007). Surveys were therefore undertaken in calm, dry weather conditions when temperatures were >10^{o}C ensuring optimum foraging activity.

3.4.12 Two surveyors conducted each building survey and were located to optimise the area covered during the surveys.

3.4.13 Building surveys were undertaken between 30th July and 1st August 2008, and between 23rd and 26th September 2008. The majority of buildings were surveyed once, however an additional dusk survey was conducted on the buildings of East Shield Hill (North) because of the high level of activity recording during the previous dawn survey.

Tree Surveys

3.4.14 Surveys of trees with high bat potential aim to determine:

- Whether bats are using particular trees as roosts
- What species of bat are present in the roost
- The population of bats roosting in the tree
- Whether the surrounding area is used as commuting/foraging habitat

3.4.15 The trees selected for survey were chosen during the Bat Habitat Assessment. Initially, 36 trees were identified as having high bat roost potential. However, this number was reduced to 9 trees

which fall directly under the footprint of the proposed bypass route and may be felled as a result. The location of these trees is shown on Figure 3 – Bat Survey Areas.

3.4.16 The tree surveys were carried out during dusk and dawn. Dusk surveys commenced half an hour before sunset until approximately an hour and a half after sunset. Different bat species emerge at different times (see 3.2.10) and the timing of the dusk surveys allows for any species present to be recorded. Dawn surveys commenced between 1.2 to 2 hours before sunrise and finished at sunrise or shortly afterwards.

3.4.17 Table 1 outlines the date and location of surveys and Table 2 summarises the weather conditions during each survey. Conditions during all surveys were appropriate for conducting dusk and dawn surveys.

Equipment Used

3.4.18 For all surveys detailed above surveyors were equipped with either Batbox Duet frequency division or Magenta heterodyne bat detectors which were used to identify and monitor bat activity. These detect bat echolocation sound waves and present them in a format audible to the human ear. Powerful torches assisted in locating bat activity.

3.4.19 Some species may be easily identifiable by audible characteristics during a survey, but for confirmation, recordings were made throughout the surveys. Equipment such as MP3 recorders were used to record bat echolocation onto an electronic format. These recordings are then analysed using BatSound (Version 3.31) to identify bat calls to species level.

3.4.20 All bat activity observed was recorded on survey forms, noting information such as time, species, number and behaviour. The location of each bat was marked onto a map at a scale of approximately 1:3000 for transect surveys and approximately 1:500 for roost surveys on buildings.

Timing

Table 1: Dates of Night-Time Surveys

Date of Survey	Location and Type of Survey	Sunset/Sunrise Time	Survey Start Time	Survey Finish Time
Transect Surveys				
30/07/08	Transect 1 – Dusk	21.14	21.00	23.55
30/07/08	Transect 2 – Dusk	21.14	21.05	23.31
31/07/08	Transect 3 – Dusk	21.12	21.15	00.15
31/07/08	Transect 4 – Dusk	21.12	21.15	23.05
31/07/08	Transect 5 – Dusk	21.12	21.15	23.15
23/09/08	Transect 1 – Dusk	19.05	18.50	21.00
23/09/08	Transect 2 - Dusk	19.05	18.50	21.00
24/09/08	Transect 3 – Dusk	19.02	19.00	21.08
23/09/08	Transect 4 – Dusk	19.05	18.45	21.23
23/09/08	Transect 5 – Dusk	19.02	18.30	20.45
Building Surveys				
31/07/08	East Shield Hill North – Dawn	05.14	03.55	05.16
31/07/08	East Shield Hill (South) – Dawn	05.14	03.50	05.15
24/09/08	Rose Cottage – Dawn	06.50	05.20	06.32
24/09/08	Buildings to north of East Lane End - Dawn	06.50	05.20	07.00
24/09/08	East Lane End – Dawn	06.50	05.20	07.00
24/09/08	East Shield Hill North – Dusk	19.03	18.40	21.03
25/09/08	East Shield Hill South – Dawn	06.56	05.26	06.51

Date of Survey	Location and Type of Survey	Sunset/Sunrise Time	Survey Start Time	Survey Finish Time
26/09/08	Kater Dene – Dawn	06.58	05.28	07.00
26/09/08	West Lane End - Dawn	06.58	05.30	07.00
Tree Surveys				
25/09/08	Tree 1 + 2 – Dawn	06.56	05.09	07.15
25/09/08	Trees 13 + 14 – Dawn	06.56	05.30	06.55
25/09/08	Tree 15 – Dawn	06.56	05.30	06.55
25/09/08	Tree 17 – Dusk	18.55	18.40	20.29
26/09/08	Tree 27 – Dawn	06.58	05.15	07.10
25/09/08	Tree 30 –Dusk	18.55	18.30	20.30
25/09/08	Tree 35 – Dusk	06.56	18.30	20.40

Weather Conditions

Table 2: Weather Conditions for Surveys

Date of Survey	Temp (^{0}C)	Wind Speed	Rainfall	Other
30/07/08 – Dusk	12	Calm	No recent rain.	80% cloud. It had been a very mild, sunny day.
31/07/08 – Dawn	11	Calm	No recent rain.	40% cloud cover & slight mist. A calm, clear morning.
31/07/08 – Dusk	15.5	Calm	Damp & muggy but no rain during survey.	Lots of insects. Rain throughout the day – drizzle and heavy.
23/09/08 – Dusk	10.5 -13	Calm	Light drizzle and rained prior to survey.	Damp, 100% cloud cover.
24/09/08 - Dawn	9 - 12.5	Calm	None.	Dry, overcast.
24/09/08 – Dusk	10	Calm	None.	Fine and mild.
25/09/08 – Dawn	10 -13	Calm	None.	100% cloud cover.
25/09/08 – Dusk	15-16	Calm	None.	5% cloud cover, calm evening. Mist enveloped half way through survey
26/09/08 - Dawn	8 -10	Slight breeze	None.	Dry but misty.

Personnel

Table 3: Personnel involved in the surveys

Date of survey	Personnel	Experience
30/07/08 – Dusk	Jennifer Davis	Bat surveyor with 4 years experience
31/07/08 – Dawn	Sarah Dale	Bat surveyor with 2 years experience
31/07/08 – Dusk	Victoria Bennett	Bat surveyor with 2 years experience
	Jenna McGuinness	Assistant bat surveyor
	Emma Grubb	Assistant bat surveyor
	Simon Armitstead	Assistant bat surveyor
23/09/08 – Dusk	Jennifer Davis	Bat surveyor with 4 years experience
24/09/08 - Dawn	Rebecca Barker	Bat surveyor with 2 years experience & -BCT course “Bat Surveys: a Foundation Course For Consultants”
	Jenna McGuinness	Assistant
	Gareth Parkinson	Bat surveyor with 2 years experience
	Emily Godsiffe	Assistant
	Eleanor Liddle	Assistant
24/09/08 – Dusk	Jennifer Davis	Bat surveyor with 4 years experience
25/09/08 – Dawn	Gareth Parkinson	Bat surveyor with 2 years experience
25/09/08 – Dusk	Mark Wingrove	Bat surveyor with 2 years experience
26/09/08 - Dawn	Drew Constable	4 months bat experience (including training/ work with Wildlife Trust)

	Emily Godsiffe Eleanor Liddle	Assistant bat surveyor Assistant bat surveyor

3.5 Ecological Assessment Methodology

3.5.1 Section 5.0 discusses the potential impact of the proposed development works of the proposed Morpeth Northern Bypass on bats. The method of evaluation and assessment utilised has been developed using guidance from Guidelines for Ecological Impact Assessment (IEEM, 2006). This gives guidance on the assessment of value, magnitude and impact significance. These guidelines form the basis of the assessment methodology within this report.

3.5.2 The methodology below summarises the criteria as set out in these guidelines. These criteria are based on determining firstly the nature conservation value of bats (Table 3) and secondly the magnitude of the potential impact on the species (Table 3), in order to provide an overall impact scoring and therefore the predicted impact significance (Tables 5 and 6).

3.5.3 Table 4 provides guidelines to determine the nature conservation value of bats in the Survey Area. The determined values are given in Section 5.2.

Table 4: Determining Nature Conservation Value

Nature Conservation Value	**Selected Examples (*Adapted from Biodiversity Evaluation Methods RPS Group Plc and SNH 2005*)**
Very High (International)	*High importance and rarity, international scale and limited potential for substitution.* ▪ An internationally designated site or candidate site (Special Protection Area (SPA), Special Area of Conservation (SAC), Ramsar Site, Biogenetic reserve). ▪ Internationally significant and viable areas of a habitat type listed in Annexe 1 of the Habitats Directive. ▪ Regularly occurring globally threatened species. ▪ Any regularly occurring populations of internationally important species that are rare or threatened in the UK or of uncertain conservation status. ▪ A regularly occurring significant population/number of any internationally important species.
High (National)	*High importance and rarity, national scale and limited potential for substitution.* ▪ A nationally designated site (Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR)) or a discrete area which meets the published selection criteria for national designation irrespective of whether it has yet to be notified. ▪ A viable area of a UK Biodiversity Action Plan (BAP) priority habitat or of smaller areas of such habitat that is essential to maintain the viability of a larger whole. ▪ A regularly occurring significant population/number of any nationally important species i.e. listed on the 1981 Wildlife and Countryside Act (as amended). ▪ Any regularly occurring population of a nationally important species that is threatened or rare in the county or region. ▪ A feature identified as of critical importance in the UK BAP.
Medium (Regional/ District)	*High or medium importance and rarity, regional scale, limited potential for substitution.* ▪ Viable areas of key habitat identified in the Regional/District BAP or smaller areas of such a habitat which are essential to maintain the viability of the larger whole. ▪ Regional/District significant and viable areas of key habitat identified as being of regional value in the appropriate Natural England Natural Area. ▪ Any regularly occurring significant population of a species listed as being nationally scarce, or in the Local BAP or relevant Natural Area on account of its regional rarity or localisation. ▪ Significant populations of a regionally/county important species. ▪ Sites such as County Wildlife Sites or Sites of Importance for Nature Conservation, selected on Regional/District criteria.

Nature Conservation Value	Selected Examples (***Adapted from Biodiversity Evaluation Methods RPS Group Plc and SNH 2005***)
	▪ Any regularly occurring significant population that is listed in a Local BAP on account of its rarity or localisation.
Low (Local)	*Low or medium importance and rarity, local scale.* ▪ Areas identified in a Local BAP or in the relevant natural area profile. ▪ Sites/features that are scarce within the locality or which appreciably enrich the local area's habitat resource. ▪ A diverse and/or ecologically important valuable hedgerow network. ▪ A significant population of a local important species i.e. listed in the Local BAP. ▪ Species populations of local importance.
Negligible	*Very low importance and rarity, local scale.* ▪ Areas of habitat considered to appreciably enrich the habitat resource within the context of the Parish or Neighbourhood.

3.5.4 Secondly, the magnitude of the potential impact of the proposed redevelopment works is assessed for bats, independently of its nature conservation value or designated status, with guidelines shown in Table 5. The magnitude of the potential impact for bats at the site without mitigation is given within the Potential Impacts - Section 5, with the magnitude of the potential impact with mitigation given within the Mitigation Section 6. The magnitude of impact can be both adverse and beneficial.

Table 5: Determining the Magnitude of the Potential Impact

Magnitude of Impact		Typical criteria descriptors
Major	Negative	Loss of resource and/or quality and integrity; severe damage to key characteristic features or elements.
	Positive	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality.
Moderate	Negative	Significant impact on the resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements.
	Positive	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Minor	Negative	Some measurable change in attributes quality or vulnerability; minor loss of or alteration to, one (or maybe more) key characteristics, features or elements.
	Positive	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	Negative	Very minor loss or detrimental alteration to one or more characteristics, features or elements.
	Positive	Very minor benefit to or positive addition of one or more characteristics, features or elements.
No change		No loss or alteration of characteristics, features or elements; no observable impact in either direction

3.5.5 Based on the nature conservation value of the species and the predicted magnitude of the potential impact, the overall significance of an impact can then be determined according to Table 4. The impact significance in relation to bats is discussed in Section 5.0.

3.5.6 The overall significance categories described in Table 4 can be applied to beneficial as well as adverse effects.

Table 6: Overall Ecological Impact Significance

Nature Conservation Value of Site	Magnitude of Potential Impact				
	Major	**Moderate**	**Minor**	**Negligible**	**No change**
Very high	Very Large	Large or Very Large	Moderate or Large	Slight	Neutral
High	Large or Very Large	Moderate or Large	Slight or Moderate	Slight	Neutral
Medium	Moderate or Large	Moderate	Slight	Neutral or Slight	Neutral
Low	Slight or Moderate	Slight	Neutral or Slight	Neutral or Slight	Neutral
Negligible	Slight	Neutral or Slight	Neutral or Slight	Neutral	Neutral

3.5.7 The greater the environmental value or magnitude of impact the more significant the effect. In some cases the significance is shown as being one of two alternatives. In these cases a single description should be assigned with a reasoned judgement for the level chosen. This allows for the application of professional judgement in appraising significance between individual sites that may not have equal significance within their context. Judgement should be based on the significance categories outlined in Table 6.

Table 7: Ecological Significance

Significance Category	Typical descriptors
Very Large	Only adverse effects are normally assigned this level of significance. They represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However a serious change in a site or feature of district importance may also enter this category.
Large	These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process.
Moderate	These beneficial or adverse effects may be important, but are not likely to be key-decision making factors. The cumulative effects of such issues may become a decision making issue of leading to an increase in the overall adverse effect on a particular resource or receptor.
Slight	These beneficial or adverse effects may be raised as local issues. They are unlikely to be critical in the decision making process, but are important in enhancing the subsequent design of the project.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

3.5.8 Where impact significance is assessed as very large or large adverse in accordance with Table 6, this represents a significant effect that would be unacceptable under the Environmental Impact Assessment regulations. A moderate adverse effect is also considered to be significant but could be acceptable with design amendments, possible further survey and revised impact specific mitigation.

3.5.9 In terms of protected species, it should be noted that irrespective of the ecological impact significance, mitigation will be required to ensure the law is not contravened (Section 5).

Results

4 Results

4.1 Ecological Data Search

4.1.1 A summary of consultee responses received as a result of the data search is given in Appendix A – Consultee Responses.

4.1.2 Northumberland Biodiversity Partnership (http://www.northumberlandbiodiversity.org.uk) state that ten species of bat have been recorded in Northumberland. These species, listed below, have the potential to be present on the proposed Morpeth Bypass site:

- Brandt's bat (*Myotis brandtii*)
- Brown long-eared
- Common pipistrelle
- Daubenton's bat (*Myotis daubentonii*)
- Leisler's bat (*Nyctalus leisleri*)
- Nathusius' Pipistrelle (*Pipistrellus nathusii*)
- Natterer's bat (*Myotis nattereri*)
- Noctule
- Soprano pipistrelle
- Whiskered bat (*Myotis mystacinus*)

4.1.3 Of the data search consultees, only the Northumberland Bat Group, the EYE Project and Northumberland Wildlife Trust responded to the ecological data search with bat data.

4.1.4 Northumberland Wildlife Trust provided information about the presence of bat roosts within Howburn Woods. No further detailed records were provided.

4.1.5 The EYE Project has one record of common pipistrelle at NZ 240867. This record is approximately 3km south east of the beginning of the proposed bypass route at Whorral Bank Roundabout.

4.1.6 Northumberland Bat Group reported that there are five known roost sites within 2km of the proposed bypass route:

- Soprano pipistrelle roost of 618 individuals approximately 1.4-2.4km south of proposed bypass route (NZ 1985), recorded in 2007.
- Pipistrelle spp. roost of 66 individuals approximately 0.4-1.4km south of proposed bypass route (NZ 1986), recorded in 1994.
- Brown long eared roost of 13 individuals within 1km north/north west of proposed bypass route (NZ 1782), recorded in 2007.
- Unknown species, roost of 1 individual within 0.4-1.4km south of proposed bypass route (NZ 1986), recorded in 1993.
- Unknown species, unknown number of individuals within 0.4-1.4km of proposed bypass route (NZ 1986), recorded in 2003.

4.1.7 The bat group also has records of common pipistrelle, Daubenton's and Natterer's bats foraging within 2km of the Survey Area. Daubenton's, brown long-eared, common pipistrelle, soprano pipistrelle, noctule, Natterer's, whiskered/Brandt's bats have all been recorded in the wider area. Records include unspecified roosts, hibernation roosts and commuting bats. Along with identified species there are a number of records of roosts for unidentified species. Roosts and field records for a number of bat species found within the Survey Area are detailed in Appendix A – Consultee Reponses.

4.1.8 The data received shows that there is a range of bat species present in the local area. The records supplied by Northumberland Bat Group use four figure Grid References, and therefore the records only indicate which 1km square the record was noted, rather than accurately

pinpointing the location of the data. The distance from the proposed bypass route is therefore provided as a range.

4.2 Bat Habitat Assessment

Roosting Habitat - Trees

4.2.1 Suitable bat roost habitat is present throughout the Survey Area within various areas of woodland (see 1.1.3). The Bat Habitat Assessment concentrated on assessing trees for bat roost potential within or adjacent to the proposed bypass footprint. From this assessment, thirty-six trees were considered to have high bat roost potential. These are summarised in Appendix B – Tree Roost Assessment and are mapped in Figure 4 – Bat Habitat Assessment.

4.2.2 Of the thirty six trees considered to have high bat roost potential, nine trees fall directly within or adjacent to the footprint of the proposed bypass route. These nine trees were selected for further dawn and dusk activity surveys.

4.2.3 Although trees with potential roosting habitat were identified, no evidence of bat roosts was noted during the habitat assessment.

Roosting Habitat – Buildings

4.2.4 All buildings within the Survey Area were considered to have some bat roost potential and were therefore selected for further activity surveys. These buildings are mapped in Figure 4 – Bat Habitat Assessment and are described in Table 8 below:

Table 8: Building Descriptions

Building Name	Distance from proposed bypass route	Description	Bat Potential?
East Lane End	Approximately 0.08km south	This is a working farm with one stone built house with a slate roof and wooden facias, seven barns (either stone or corrugated iron), and one stone outbuilding. Surrounding habitat is pasture. There is bat potential in many of the buildings.	Yes
Buildings to the north of East Lane End	Approximately 0.09km north	This cluster consists of 2 residential buildings and a wooden shed/garage. The northern residential building is red-brick with a slate roof and is covered in dense ivy, with flat-roof extensions to the east and west. The southern residential building is white-wash with a slate roof. There is bat potential particularly within the northern residential building.	Yes
East Shield Hill North	Approximately 0.2km north east	A cluster of residential buildings. There are numerous red-brick houses with pantile roofs and some stone houses with slate roofs. The majority appear to be in good condition, with no visible tiles missing, the gable ends have concrete slabs and ridge tiles are cemented on with no visible gaps. There are well manicured, mature gardens. A watercourse runs to the east of the properties.	Yes
East Shield Hill South	Approximately 0.15km north east	This is a stone house with a small outbuilding to the west. There is some bat potential on the east side where there is a large gap on the gable end but little other potential seen. There is a block of broadleaf woodland to the north and west, which borders a watercourse.	Yes
Kater Dene	Approximately 0.07km north	A converted farm consisting of a newly converted/constructed stone house with a slate roof, three sheds, one brick outbuilding and one brick barn. The sheds are constructed from corrugated iron, red-brick, or are wooden. There is a sunken brick construction to the west of the house that has a flat, concrete roof. Many holes exist in the concrete and therefore has the potential to be used as a	Yes

		hibernacula. Surrounding habitat is arable. There is some bat potential under the facias of the house and within the barn.	
Rose Cottage	0km	This is a red-brick bungalow with a slate roof and a small flat-roof extension to the north that has a bituminous roof material. There are wooden facias and concrete barge boards around the red-brick section. There are few visible gaps however there is some bat potential.	Yes
West Lane End	Approximately 0.15km south west	A working farm containing one red-brick residential property with a slate roof and wooden barge-boards, and a collection of sheds, barns, outbuildings and a garage. These are a combination of brick and stone, the majority with slate roofs. Surrounding habitat is pasture. There is bat potential throughout the site, including within brickwork and the roofs.	Yes

Foraging Habitat

4.2.5 Suitable bat foraging habitat is present along the whole length of the proposed bypass route. Foraging and commuting opportunities for bats exist in arable, improved and semi-improved grassland fields, lined with predominately species-poor defunct hedgerows and barbed wire fencing.

4.2.6 The hedgerows and watercourses present within the Survey Area act as wildlife corridors which connect different areas of habitat within the Survey Area and the surrounding wider area. These corridors would be used by any bats present to navigate around and between different areas.

4.2.7 Hedgerows within the Survey Area were assessed and the results are summarised in Appendix C – Hedgerow Assessment and are mapped in Figure 4 – Bat Habitat Assessment. Six hedgerows in particular are considered important for connectivity of habitat:

- H5 – connects Howburn Wood to foraging habitat to the north of the proposed bypass.
- H8 – connects corridor between Fulneck Grange and Howburn Woods to foraging habitat to the north of the proposed bypass.
- H16 – joins woodland to south to woodland to north, along Cotting Burn.
- H17 – continuation of H16 .
- H18 – connects East Lane End Farm to foraging habitat and woodland to north.
- H9 – together with a tributary spring of Cotting Burn, this line of mature trees at H9 connects Howburn woods to woodland at Fulbeck Grange

4.2.8 Watercourses in the Survey Area that provide potentially good flight lines are:

- How Burn – connects Howburn Wood to foraging habitat to the north.
- Cotting Burn – connects small areas of woodland to south to north.

4.3 Bat Activity Surveys

Transects

4.3.1 Bat activity was recorded along all five transects surveyed. The results can be found in Figure 5 – Bat Activity Maps for Transects. The maps should be read in conjunction with the appropriate recording sheet found in Appendix E – Bat Survey Recording Forms.

4.3.2 Peak foraging and commuting activity was recorded in the following areas:

- Transect 1 – close to Cotting Burn (11 common pipistrelle, 2 soprano pipistrelle, 1 Daubenton's).
- Transect 2 – southern side of transect, flight line between Howburn Wood and Fulbeck Grange (12 common pipistrelle, 6 soprano pipistrelle, 6 Daubenton's, 2 Natterer's and 1 noctule/Leisler's bat).
- Transect 3 – along How Burn (12 common pipistrelle, 9 soprano pipistrelle, 5 Daubenton's, 1 noctule, 1 noctule/Leisler's bat).

- Transect 4 – southern side of transect, edge of Howburn Wood (17 common pipistrelle, 16 soporano pipistrelle, 6 Daubenton's, 1 noctule).
- Transect 5 – western side of transect, edge of Howburn Wood (7 common pipistrelle, 3 soprano pipistrelle, 2 Daubenton's, 1 whiskered/Brandt's). .

4.3.3 Bat activity was recorded directly within the proposed bypass route at the following points:

- Transect 1 - Stopping point 2
- Transect 1 - Stopping point 4
- Transect 1 - Stopping point 6
- Transect 2 - Stopping point 7
- Transect 2 - Stopping point 9
- Transect 2 - Stopping point 12
- Transect 3 - Stopping point 13
- Transect 3 - Stopping point 14
- Transect 4 - Stopping point 16
- Transect 5 - Stopping point 17

4.3.3.1 Furthermore, bat activity was also recorded near to stopping points and it is therefore likely that the bat would pass the proposed bypass route. Points at which activity was heard near to a stopping point include:

- Transect 1 - Stopping point 1
- Transect 2 - Stopping point 8
- Transect 2 - Stopping point 10
- Transect 2 - Stopping point 11

4.3.3.2 The following bat species were recorded during the transect surveys:

- Common pipistrelle
- Soprano pipistrelle
- Daubenton's bat
- Whiskered/Brandt's bat
- Noctule
- Natterer's bat
- Noctule/Leisler's bat[1]

Buildings

4.3.4 Bat activity was recorded in the vicinity of all buildings surveyed, expect at Kater Dene where no activity was recorded. Table 9 summarises the bat activity at each site, together with Figure 6 – Bat Activity Maps for Buildings and Appendix E – Bat Survey Recording Forms.

Table 9 – Summary of bat activity (buildings)

Building	Date of survey	Activity recorded	Roosts recorded
Buildings to the north of East Lane End	24/09/08 Dawn	Noctule bats recorded commuting.	None.
East Lane End	24/09/08 Dawn	Common and soprano pipistrelle bats foraging and commuting.	One common pipistrelle went to roost in farm building, under facia. [2]
East Shield Hill (North)	31/07/08 Dawn	Common pipistrelle, soprano pipistrelle, Daubenton's and noctule recorded commuting and foraging.	None at buildings. It is thought that the noctules may be roosting in Howburn Wood.

[1] On 3 occasions the species of bat could not be distinguished between noctule and Leisler's despite sound analysis.
[2] Red type indicates a bat roost.

Building	Date of survey	Activity recorded	Roosts recorded
East Shield Hill (North)	24/09/08 Dusk	Common pipistrelle, soprano pipistrelle and noctule recorded commuting and foraging. Bat dropping found on building furthest east, fronting watercourse on 24/09/08.	None at buildings during survey, but bat dropping indicates that bats have used buildings for roosts. Home owner of 'The Granary' states that bats, possibly pipistrelles, are roosting in her house.
East Shield Hill (South)	31/07/08 Dawn	Common and soprano pipistrelle, noctule and Daubenton's recorded foraging and commuting.	Large bat observed to go under ivy under eaves at SW corner of house. Bat was not echolocating so species could not be positively ascertained, although thought to be a larger bat.
East Shield Hill (South)	25/09/08 Dawn	Common and soprano pipistrelle, and noctules recorded commuting.	Non-echolocating bat thought to land on building, between the end wall and roof, on the northerly aspect. Potentially a roost.
Kater Dene	26/09/08 Dawn	No bat activity recorded.	None.
Rose Cottage	24/09/08 Dawn	Soprano pipistrelle foraging and commuting.	One soprano pipistrelle went to roost in Rose Cottage.
West Lane End	26/09/08 Dawn	Soprano pipistrelle foraging.	One soprano pipistrelle went to roost in barn outbuilding.

4.3.5 Roosts were positively identified at East Lane End, Rose Cottage and West Lane End. Potential roosts are also present at East Shield Hill North and East Shield Hill South. All of the roosts found were single bats of common species, although communication with the owner of The Granary at East Shield Hill North suggests that this has at some point been a large roost, although no evidence of this was found during these surveys. The species of bat roosting at East Shield Hill (South) could not be identified on either visit due to lack of echolocation.

Trees

4.3.6 Bat activity was recorded in the vicinity of all the trees with high bat roost potential that were selected for survey.

4.3.7 Although trees with potential roosting habitat were identified, only Tree 17 was recorded as being used by bats for roosting at the time of survey. Table 8 summarises the activity recorded at the trees surveyed.

Table 10 – Summary of bat activity (trees)

Tree No.	Date of survey	Activity recorded	Roosts recorded
1 + 2	25/09/08 – Dawn	Common pipistrelle and Daubenton's foraging and commuting in area.	No bats recorded roosting in trees.
13 +14	25/09/08 -	Common and soprano pipistrelle and noctule foraging and	No bats recorded roosting in

Tree No.	Date of survey	Activity recorded	Roosts recorded
	Dawn	commuting in area.	trees.
15	25/09/08/ - Dawn	Common and soprano pipistrelle, and Daubenton's foraging and commuting in area.	No bats recorded roosting in trees.
17	25/09/08 – Dusk	Common and soprano pipistrelle and Daubenton's commuting and foraging in area.	Two soprano pipistrelle recorded emerging from tree.[2]
27	26/09/08 – Dawn	Common and soprano pipistrelle commuting nearby.	No bats recorded roosting in tree.
30	25/09/08 – Dusk	Noctule, common and soprano pipistrelle and Daubenton's foraging and commuting in area.	No bats recorded roosting in tree.
35	25/09/08 – Dusk	Common and soprano pipistrelle and noctule/Leisler's foraging and commuting in area.	No bats recorded roosting in tree.

4.4 Significance of Results

Transects

4.4.1 The results of the transect survey indicate that bat activity is present along the whole length of the proposed bypass route and that bats use existing hedgerows and watercourses as flightlines for commuting and foraging. Bat activity was recorded directly within the footprint of the proposed bypass route and also along hedgerows and watercourses which would be severed by the proposed bypass route.

4.4.2 Species of bat recorded along the transects include common pipistrelle, soprano pipistrelle, noctule, Daubenton's, Natterer's and whiskered/Brandt's. In addition, there are 3 records of a noctule/Leisler's bat because the species could not be determined from the recordings. The significance of these species is shown in Table 11 below. The species of greatest significance are whiskered/Brandt's and Natterer's, neither of which are common even on a National scale. If Leisler's is present on the site this would be a significant record, as this bat is classed as rare.

Table 11: Significance of species recorded

	National Scale	Regional Scale[3]	Local Scale[4]
Common pipistrelle	Common and widespread	Common and widespread	Common and widespread
Soprano pipistrelle	Common and widespread	Common and widespread	Common and widespread
Noctule	Frequent and widespread	Frequent and widespread	No records gathered
Daubenton's bat	Common and widespread	Common and widespread	No records gathered
Whiskered/ Brandt's	Scarce and widespread	Scarce and widespread	No records gathered
Natterer's bat	Frequent and widespread	Frequent and widespread	No records known
Leisler's bat	Rare and widespread	Rare and distribution unknown	No records known

[2] Red type indicates a bat roost
[3] Data obtained from Northumberland Bat Group webpage.
[4] Data obtained from the 2km Ecological Data Search for the Survey Area (see Section 4.1)

4.4.3 Stopping points of particular importance are:

- Stopping point 4 – due to abundance of bats identified using the flight line.
- Stopping point 7 – due to abundance of bats identified using the flight line.
- Stopping points 11 to 13 – due to abundance of bats identified using the flight line.
- Stopping point 10 – due to Natterer's bat identified nearby.
- Fence line between stopping points 18 and 19 – due to whiskered/Brandt's bat identified nearby.

4.4.4 Other points of particular importance are:

- Cotting Burn
- How Burn
- Howburn Wood (north and eastern edges)

4.4.5 Although the proposed bypass route does not directly impact Howburn Wood, it is an important foraging patch. Bats may therefore commute along hedgerows/fence lines that are dissected by the proposed route in order to reach the favoured foraging patches. For example, a roost is known at East Shield Hill South and evidence suggests that a further roost is present at East Shield Hill North. It is therefore likely that the bats detected along How Burn and Howburn Wood originate from these roosts, thereby the proposed bypass route would sever the roost from foraging areas. A species of particular note using this flight line is the noctule/Leisler's bat.

Buildings

4.4.6 The results of the dawn and dusk building surveys indicate that bats are potentially roosting in five of the nine groups of buildings surveyed, although those at East Shield Hill North and South are not definitively confirmed. All roosts contain single bats of common species at National, Local and Common scales (although the species at East Shield Hill South in September could not be confirmed due to a lack of echolocation). This indicates that the bats are probably males or non-breeding females using summer roosts.

4.4.7 Although no bat roosts were recorded at the remaining four buildings at the time of survey, there is anecdotal evidence of a past roost in The Granary at East Shield Hill North and the remainder of the buildings all offer suitable roosting habitat.

Trees

4.4.8 Only Tree 17 was recorded as a soprano pipistrelle roost. This species of bat is common and widespread on a National, Regional and Local scale (see Table 11 above). Two bats were observed utilising the roost, indicating that they are probably males or non-breeding females using a summer roost.

The Nature Conservation of the Bat Population

4.4.9 The nature conservation value of the bats roosting in the vicinity of the proposed bypass route is considered to be **medium.** All six species identified during the survey work are listed on the Local BAP, and soprano pipistrelle and noctule bats are also featured on the UK BAP, and are therefore of importance nationally. However, the relatively small number of bats recorded at the site would prevent it from being considered as high nature conservation value. No maternity roosts were identified and it is thought that the majority of the roosting comprises individual males and non-breeding females.

Impacts

5 Impacts

5.1 Impact Assessment Outline

5.1.1 This section discusses the potential impacts of the proposed bypass on bats at the site. These impacts have been determined using the results of the survey visits and the ecological data search.

5.1.2 The impact assessments described below are based on the impact scoring system defined in Section 3.5..

5.1.3 Buildings and trees which are confirmed to be used by bats as roosts should be considered as protected habitat. Bat roosts are protected whether or not bats are present. If a bat roost was found in a tree or building which required removing because it fell within the development footprint, a development licence from Natural England will need to be obtained before any potentially disturbing works can commence. Mitigation measures as recommended in Section 6 would form the basis of the licence application.

5.1.4 The content of this section is based upon the proposed bypass route shown in Figure 2 – Proposed Bypass Route. The impacts described here maybe subject to review if the final proposals alter significantly.

5.1.5 The potential impacts to bats resulting from the construction of the proposed development can be split into three categories:

- **Short-term impacts**: Disturbance during building works at the site, increased human presence, extra noise and changes in site layout.
- **Long-term impacts**: Roost modification, roost destruction, and fragmentation and isolation of habitat.
- **Post-development interference impacts**: Increased noise, light and human activity through road use following completion of the works.

5.1.6 The significance of the impact on bats has been obtained according to the tables within the Methodology - Section 3.5. The overall impact scores discussed here are without mitigation; impacts following mitigation are provided in Section 6 – Mitigation and Recommendations. Refer to Section 6 for outline mitigation measures to minimise the potential impacts identified.

5.2 Impact Assessment

Roosting Habitat

5.2.1 Short term impacts include the disturbance of nearby roost sites during the construction phase. Disturbance could be in the form of increased human presence, extra noise, dust, vibrations, changes in site layout, and an increase in lighting if night-time working is required. Roosts range in distance from 0.08km (East Lane End) to 0.2km (East Shield Hill North) from the proposed pipeline route. The magnitude of this impact is therefore considered to be ***minor negative***, and with the nature conservation value of the bats roosting in the vicinity of the proposed bypass route considered to be medium, this leads to an ecological impact significance of ***slight adverse***.

5.2.2 Long term impacts include roost destruction at Rose Cottage and Tree 17, which are the only roosts that appear to the be within the footprint of the proposed bypass route.. Further impacts include the loss of other potential roost sites, such as the small area of woodland at the north eastern tip of Howburn Wood. This would have a ***major negative*** impact on the bats within these roosts, leading to an ecological impact significance score of ***large adverse***. There is a risk that bats could be injured or killed if the correct procedure is not undertaken during demolition.

5.2.3 Post development interference impacts include an increase in noise, light and human activity through road use following completion of the works. Illuminating a bat roost can create disturbance and may cause the bats to desert the roost. Light falling on a roost access point can delay bats from emerging and this shortens the amount of time available to them for foraging. As the main peak of nocturnal insect abundance occurs at and soon after dusk, a delay in emergence means this vital time for feeding is missed. This will affect roost sites adjacent to the new road. This is considered to have a ***moderate negative*** impact on the roosts, leading to an ecological impact significance score of ***moderate adverse.***

Foraging/Commuting Habitat

5.2.4 Short term impacts to foraging and commuting habitat during the construction phase include an increase in lighting if night-time work is required and through changes in site layout. The magnitude of this impact is considered to be ***minor negative*** leading to an ecological impact significance of ***slight adverse.***

5.2.5 Long term impacts include the permanent loss of foraging and commuting habitat along the whole route. The main habitats lost will be improved grassland, pasture, woodland edge, hedgerows and arable.

5.2.6 Table 12 below, adapted from the guidance Habitat Management for Bats (JNCC, 2001) shows the level of importance of the habitats that will be lost to the species recorded as present.[5]

Table 12: Importance of habitats to bat species present

	Pipistrelle	Noctule	Daubenton's	Whiskered	Brandt's	Natterer's	Leisler's
Woodland Edge	High	High	Medium	High	Medium	High	Low
Tree line	High	Low	Medium	Low	Low	High	Low
Hedgerow	High	Low	High	Low	Medium	High	Low
Watercourses	High	High	High	High	Low	Low	High
Riparian Vegetation	High	High	High	High	High	High	Low
Pasture	Medium	Medium	Low	Low	Low	High	High
Meadow	Medium	Medium	Low	Low	Low	High	Medium
Arable	Medium	Low	Low	Low	Low	Medium	Low

5.2.7 The proposed bypass route severs potential roosting habitat to the south, from good foraging habitat to the north, and the flightlines that connect these areas leading to severe habitat fragmentation. Severance of habitat is of greatest concern as regards pipistrelle species, Daubenton's and Natterer's, as they use existing linear landscape elements to navigate between foraging areas whereas noctules generally fly in the open and at height.

[5] Whiskered and Brandt's bats are commonly classed together as it is impossible to distinguish between these species unless in the hand. On this occasion, noctule and Leisler's bats could also not be distinguished through sound analysis for 3 records.

5.2.8 According to Figure 2 – Proposed Bypass Route, the proposed bypass would sever 18 hedgerows and would cross 2 watercourses – Cotting Burn and How Burn. The latter was recorded as being used as commuting flightline for noctule bats returning to roost at Howburn Wood. Cotting Burn also provides a flightline between potential roosting habitat at Fulbeck Grange and woodland to the north of proposed bypass route.

5.2.9 The proposed bypass route would sever all flightlines between Fulbeck Grange and Howburn Wood, which are considered to be potential roosting habitat.

5.2.10 Changes to the environment around the proposed bypass route due to the severance of hedgerows and watercourses may alter the commuting patterns of bats utilising the site.

5.2.11 The magnitude of the impact is considered to be ***major negative.*** The overall ecological impact significance is therefore estimated to be ***large adverse.*** These adverse effects are considered to be very important considerations and are likely to be material in the decision-making process.

5.2.12 Post development interference impacts associated with foraging and commuting habitat is through the risk of fatality/injury by traffic on the road, the increase in noise, and by lighting.

5.2.13 Artificial lighting can affect the feeding behaviour of bats. There are two aspects to this; one is the attraction that light from certain types of lamps has to a range of insects; the other is the presence of lit conditions. Lighting can be particularly harmful if placed along features that bats use as flightlines, such as woodland edges, water corridors and hedgerows.

5.2.14 Artificial lighting is also thought to increase the chances of bats being preyed upon. Many avian predators will hunt bats which may be one reason why bats avoid flying in the day (Bat Conservation Trust, undated). Although a certain amount of security and street lighting is currently present in the area, the proposed bypass route would possibly result in an increase of street lighting, particularly at junctions.

5.2.15 Furthermore, the built road effectively acts a barrier to bat movement due to the risk of bats being killed/injured by vehicles using the road.

5.2.16 The magnitude of the impact could potentially be ***major negative*** due to the risk of fatalities and fragmentation**,** which would produce an overall ecological impact significance of ***moderate adverse.*** These adverse effects may be important, but are not likely to be key-decision making factors.

Overall Impact

5.2.17 Overall, it is considered that there would be a ***major negative*** impact on an aspect of ***medium conservation value,*** thereby producing an overall ecological impact significance without mitigation of ***large adverse***.

FABER MAUNSELL | AECOM

Mitigation and Residual Impacts

6 Mitigation and Residual Impacts

6.1 General Mitigation

6.1.1 Four common forms of mitigation are recognised as follows:

- Avoidance
  - Avoidance and prevention of adverse impacts through the design of the scheme and sensitive programming of works, for example retaining key ecological features, e.g. avoid removal of tree/scrub habitats.
- Reduction
  - Mitigation to reduce the scale and severity of impacts, for example restricting construction access in areas of ecological interest or timing works to avoid most vulnerable periods.
- Compensation
  - Compensation to offset adverse ecological impacts through habitat creation, for example provision of alternative bat roosting sites.
- Enhancement
  - Enhancement and improvement of existing conditions, for example creation of foraging areas and improving potential flight paths.

6.1.2 Mitigation of potential adverse impacts on habitats during construction and operation of the scheme should be undertaken. In general, where an impact is unavoidable, localised mitigation measures should be implemented and the greater the predicted impact, the greater the level of mitigation that would be required.

6.2 Bat Mitigation Measures: Rose Cottage

6.2.1 A bat roost at Rose Cottage will be lost as a result of the development proposals for Morpeth Northern Bypass.

Licence Application to Exclude Bats

6.2.2 Due to the fact that bats and their roosting habitat are legally protected, a licence from Natural England would need to be applied for and obtained before any disturbance works to a roost can be undertaken. As part of the licence application, a method statement would need to be prepared detailing how bats will be protected before, during and following the proposed development works, including timings and compensation measures. This will involve discussions between a bat ecologist and Northumberland County Council to compile an appropriate mitigation strategy.

6.2.3 Licences can take in the region of three months to obtain once all the relevant information has been provided to Natural England (NE) and this should be considered when programming works on site. Full planning permission for the works must have been granted before a licence can be issued. The licence will be issued in the developer's name and they will be legally bound by the conditions of the licence.

6.2.4 The Local Planning Authority (LPA) is contacted as part of the licence application process to provide information on previous planning applications at the site and to determine whether they have any objections to the proposals. Licence decisions may take longer depending upon the speed of the responses from the LPA and NE.

6.2.5 Natural England will only issue a licence for the purposes of "*preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment".*

6.2.6 In addition, a licence cannot be granted unless "*there is no satisfactory alternative"* and "*the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range."*

6.2.7 Further surveys of this building would be required in order to apply for a Natural England Licence.

6.2.8 Another set of surveys will be required on all buildings to inform future stages of the assessment. .

Timing

6.2.9 The surveys undertaken show that a small number of bats are roosting on site at least between July and September. However, it is possible that they are also present in the vicinity of the proposed bypass route at other times of the year It is important, therefore, during future stages of assessment of this proposed bypass scheme, that additional surveys are undertaken during important bat roosting stages. These may include the following:-

- Hibernation surveys conducted between January and February
- Maternity roosting surveys conducted between June – July
- Summer activity surveys undertaken between May – September
- Autumn swarming surveys undertaken between October and November

6.2.10 As the majority of roosts are used only seasonally, there is usually some period when bats are not present. Therefore, the timing of demolition and renovation works at this site can be programmed to avoid the times when bats are likely to be present and at their most vulnerable. With further survey, it will be possible to ascertain the periods in which it is preferable to carry out works.

6.2.11 The Habitats Regulations protect the individuals as well as their roosts therefore precautions must be taken to avoid the deliberate killing or injury of bats which is most unlikely to be permitted under the terms of the licence. Disturbance of bats and/or the destruction of roosts may be permitted under licence, but conditions are likely to apply (English Nature, 2004).

6.2.12 It is recommended that demolition works (buildings and walls) are conducted in either October to early November before the main hibernation period starts or in March to early May before the main summer roosting starts. This is weather dependant and some flexibility with timings should be expected.

6.2.13 It maybe possible that some works such as removing roof tiles, dismantling some brickwork could be conducted prior to full demolition in order to make Rose Cottage less attractive to roosting bats.

Mitigation measures

6.2.14 A replacement roosting site needs to be provided to replace the lost roost at Rose Cottage. As one single bat was recorded roosting at the site at the time of survey, correctly positioned bat boxes would be sufficient to compensate for the loss. The finer details of the mitigation for Rose Cottage will be finalised with further survey within the licence application to Natural England.

6.3 Bat Mitigation Measures: Trees

6.3.1 During the September surveys, a common pipistrelle was recorded roosting in Tree 17 (see Figure 3 – Bat Survey Areas). According to the proposed bypass route shown in Figure 2 – Proposed Bypass Route, the tree will not fall directly under the proposed bypass route and therefore should not need to be removed.

6.3.2 However, there are trees considered to have high bat roost potential that fall directly in the footprint of the proposed bypass route that will need to be removed.

6.3.3 The felling of trees must always be undertaken with extreme caution under the assumption that bats may be present. Trees due to be felled should always be checked for signs of bats prior to felling; this is particularly the case for standing deadwood. Signs of roosting bats would include

tiny scratches and staining around entry point to roost, bat droppings in/around/below entrance and the smoothing of surfaces around the roost entrance.

6.3.4 In the event that trees are required to be removed, those which provide potential roost opportunities must be felled at a time which avoids the summer (breeding season) and winter (hibernation season):

- Late August to early October is the optimum time to carry out work on trees with bat roost potential as young bats are on the wing and the hibernation season has not yet commenced. However, consideration should be given to the presence of late breeding birds before trees are removed as breeding birds are protected under the Wildlife and Countryside Act 1981 (as amended).
- March or April is also a suitable time to carry out work on trees with bat roost potential, as bats are starting to move out of their winter hibernacula yet have not set up maternity roosts yet. Again, consideration for nesting birds should be given.

6.3.5 Felling of trees with high bat roost potential should be undertaken under the supervision of a suitably qualified ecologist – these trees are shown on Figure 4 – Bat Habitat Assessment. After the ecologist has checked the tree, it should be felled in stages, with branches lopped off individually rather than felling at the trunk. The trunk should then be felled in sections. The felled branches and sections of trunk should be carefully laid on the ground making sure that any holes or crevices are not blocked and are facing downwards so rain water cannot enter, but also positioned to enable any bats present to easily vacate the crevice. Branches and trunk sections should be left in place for 48 hours to allow any bats to vacate prior to their removal.

6.3.6 A suitable buffer zone should be placed around potential bat roost features. Any trees and wooded areas which are to be retained and which lay within or close to the working or site area, such as Tree 17 for example, should be protected by means of a post and wire fence with 'Netlon' fluorescent mesh. The fence should be placed at a minimum distance of the radius of the crown of the tree as this is roughly the extent to which the tree's roots will spread underground. The protective fencing should be maintained during the period of site works and no machinery or materials should be stored within the fenced area. Retained woodland should be managed carefully avoiding removal of understorey.

6.3.7 Further surveys should be undertaken on all trees that will be impacted by the construction of the bypass. Bats use a variety of roosts throughout the year; Cowan (2002) estimated that bats on average spend 1.75 days in one place before changing roost sites. It is therefore highly likely that other trees within the footprint of the proposed bypass route contain bat roosts, but were not in use during the particular night of survey.

6.4 Bat Mitigation Measures: Foraging and Commuting Habitat

6.4.1 Successful mitigation for habitat severance is not well established (Highways Agency, 2008) but provision of crossing structures for commuting bats should be provided (see Section 6.5). The protection of flightlines is extremely important in maintaining the ability of bats to access roosts and foraging areas.

6.4.2 Due the number of linear features running perpendicular to the proposed bypass route, the bypass will unavoidably dissect hedgerows and watercourses. An alteration of the route option would not minimise this impact.

6.4.3 The proposed bypass will result in a large amount of land loss and it is highly recommended that hedgerows are planted along the entire length of the bypass, to create a boundary and to compensate for habitat loss. The hedgerows will provide a flightline along the proposed bypass, and connect bat crossing points (see Section 6.5). To encourage bats to use this flightline, road lighting should be kept to an absolute minimum or designed such that its impact is reduced (see Section 6.6).

6.4.4 After the necessary removal of trees or hedgerows, replacement hedgerows/treelines should be planted and connected with other flightlines on the site with potential flightlines adjoining the site. Hedgerows should ultimately be connected to bat crossing points to encourage bats to cross at safer areas of the bypass and thereby reduce fatalities (see Section 6.5).

6.4.5 Replacement planting should reflect the species currently present. It should include native species such as blackthorn (*Prunus spinosa*), hawthorn (*Crataegus monogyna*) and spindle (*Euonymus europaeus*) and should include occasional fast growing standards such as wild cherry (*Prunus avium*) or field maple (*Acer campestre*). Planting strongly-scented flowering plants, such as honeysuckle *(Lonicera periclymenum*) and sweet briar (*Rosa rubiginosa*) will attract insects which would benefit foraging bats.

6.4.6 Further transect surveys will be required prior to construction to confirm the hedgerows of particular importance.

6.5 Bat Mitigation Measures: New Bridges

6.5.1 Appendix D – Scheme Proposal, shows three new bridges will cross existing watercourses; Pegswood Moor Bridge, How Burn Bridge and Cotting Burn Bridge. The new roundabout, St George's Roundabout, to be built to provide access to the proposed development at St. George's, is currently shown to cross the tributary of Cotting Burn which runs through Fulbeck Grange.

6.5.2 Road crossing points for bats need to be provided to create connections between habitats either side of the proposed bypass. The most cost effective way to achieve this would be to ensure that essential structures, such as these bridges, are designed to also incorporate a bat crossing point.

6.5.3 Ideally, a clear span bridge should be used to maintain the habitat corridor. If this is not possible however, a box culvert design could be used. A cylindrical culvert is not recommended as less airspace is available for commuting bats in a cylindrical culvert compared to a box culvert. To accommodate all species recorded in the Survey Area, a structure measuring at least 6 metres high would ensure all bat species would utilise the crossing point (Highways Agency, 2005).

6.5.4 During the construction of the proposed bypass, existing flightlines across the route should be maintained by using temporary structures such as wire and camouflage fencing which can be positioned in the area of the lost hedgerow during construction, as shown in Image 1. It is important that roosts are not isolated from foraging areas and the provision of temporary replacement flightlines should prevent this from occurring.

Image 1: Temporary replacement for flightline (Highways Agency, 2008)

6.5.5 According to Appendix D – Scheme Proposal, the proposed bypass route will cross an existing right of way, leading to Cottingwood Common. If the final design incorporates a pedestrian bridge to provide access over the proposed bypass route, this structure could also be adapted to create a suitable bat crossing point. The hedgerows leading to and from the pedestrian bridge must be intact to create a continuous flightline approaching and over the bridge.

6.5.6 If the final design does not incorporate the designs mentioned above, more detailed planting will have to be considered. Strategically placed trees could be used to increase the flight level of bats to avoid collision with vehicles using the road (Highways Agency, 2008).

6.6 Bat Mitigation Measures: Lighting

6.6.1 There is no legislation requiring an area or road to be lit (BCT/ILE, 2007); however lighting may be deemed necessary for accident prevention . Where lighting is considered essential along the proposed bypass route, the lighting design should consider the following points:

Type of lamp (light source)

6.6.2 The impact on bats can be minimised by the use of low pressure sodium lamps or high pressure sodium instead of mercury or metal halide lamps where glass glazing is preferred due to its UV filtration characteristics.

Luminaire and light spill accessories

6.6.3 Lighting should be directed to where it is needed and light spillage should be avoided. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only. Planting can also be used as a barrier or manmade features that are required within the build can be positioned so as to form a barrier.

Lighting column

6.6.4 The height of lighting columns should be as short as is possible as light at a low level reduces the ecological impact. However, there are cases where a taller column will enable light to be directed downwards at a more acute angle and thereby reduce horizontal spill. For pedestrian lighting this can take the form of low level lighting that is as directional as possible and below 3

lux at ground level. The acceptable level of lighting may vary dependent upon the surroundings and on the species of bat affected.

Light levels

6.6.5 The light should be as low as guidelines permit and if lighting is not required, it should not be used.

6.6.6 In general terms, lighting should be sensitively designed for bats along the whole bypass route, but especially at crossing points and for a distance of 10 metres either side.

6.6.7 According to the Scheme Proposal in Appendix D, Kater Dene Bridge will span the proposed bypass route, over a cutting. If lighting is required in the cutting, this will negatively affect the ability of the bridge to provide a crossing point for bats. It is therefore recommended that no lighting is used on Kater Dene Bridge, in order to encourage bats to fly along the bridge, over the cutting. However, if lighting is deemed essential, short bollard lighting is recommended.

6.6.8 The underside of the other road bridges, Pegswood Moor, How Burn and Cotting Burn Bridge should not be lit for the same reasons as stated in 6.6.7 above.

6.6.9 Night work should also be avoided during the construction phase to reduce the disturbance that additional light levels would have on bats foraging and commuting within the site.

6.7 Residual Impacts After Mitigation

6.7.1 The impact of the proposed works without mitigation is considered to be ***large adverse*** using the evaluation method detailed in Section 3.5. The scale of the impact is considered to be high due to the loss of roosting sites and the fragmentation and isolation of foraging and commuting habitat.

6.7.2 The implementation of mitigation measures will help to reduce the overall ecological impact arising from the works. This is described in Table 13 below.

Table 13: Summary of Impacts with Mitigation and Compensation

Impact	Impact Rating Without Mitigation	Mitigation	Residual Impact with Mitigation
Bat Roosts			
Disturbance from construction (noise, dust, vibrations, lighting, changes in site layout)	Slight adverse	▪ No roosts to be lit. ▪ Avoidance of night work to reduce disturbance.	Slight adverse
Roost destruction	Large adverse	▪ A Natural England licence would be gained for the demolition of any roosts. ▪ Avoid demolition at sensitive times of the year. ▪ Replacement roost sites provided. ▪ Sensitive felling of all trees with bat roost potential.	Slight adverse

Impact	Impact Rating Without Mitigation	Mitigation	Residual Impact with Mitigation
Disturbance post development from noise, light, human activity	Moderate adverse	▪ No significant flight lines to be lit. ▪ Lighting design to take bats into consideration (e.g. using lamps that are less detrimental to the bat population)	Slight adverse
Foraging/Commuting Habitat			
Disturbance from construction (lighting, changes in site layout)	Slight adverse	▪ Temporary flight lines to be constructed. ▪ Avoidance of night work to reduce disturbance.	Slight adverse
Permanent loss of foraging and commuting habitat leading to fragmentation and isolation	Large adverse	▪ Replacement of hedgerows/trees immediately after construction completed. ▪ Use of native species. ▪ Appropriate design of road bridges. ▪ Hedgerow planting to encourage bats to use safe crossing points.	Slight - Moderate adverse
Post development risk of bat fatality/injury	Moderate adverse	▪ Appropriate design of road bridges. ▪ Hedgerow planting to encourage bats to use safe crossing points.	Slight adverse
Post development disturbance and isolation through increased lighting	Moderate adverse	▪ Lighting design to take bats into consideration (e.g. using lamps that are less detrimental to the bat population).	Slight adverse

6.8 It is anticipated that the magnitude of effect with mitigation will be reduced to ***slight-moderate adverse*** as following completion there will still be some measurable change in the site quality with an alteration to the characteristics on site, namely the severing of commuting habitat. The final rating depends largely on the final detailed design; at present the location and design of bridges are at the most sensitive crossing points for bats and this should alleviate the impact greatly, on the condition that the structures allow bats to pass underneath the road. If this is not possible and bats are forced to fly over the new road the impact will be moderate adverse.

FABER MAUNSELL | AECOM

Summary

7 Summary

7.1.1 Seven species of bat were identified within the Survey Area; common pipistrelle, soprano pipistrelle, noctule, Daubenton's, Natterer's, whiskered/Brandt's and a possible Leisler's. Only Leisler's is classed as rare (although is widespread) on a national scale and is therefore of greatest significance from this set of results, however whiskered/Brandt's is classed as scarce and widespread on a national scale and is therefore also of significance.

7.1.2 Bat activity was recorded directly within the footprint of the proposed bypass route and also along hedgerows and watercourses which would be severed. Roosts were positively identified in three buildings and potential roosts exist in another two buildings. One tree was also confirmed as a roost.

7.1.3 Rose Cottage and tree 17, both of which fall within the development footprint of the proposed bypass route, were identified as roosts. Replacement roosting sites need to be provided to replace the lost roosts. As one-two bats were recorded roosting at the sites at the time of survey, correctly positioned bat boxes would be sufficient to compensate for the losses. The finer details of the mitigation for both Rose Cottage and the tree will be finalised with further survey within the licence application to Natural England. All roosting bats throughout the site were common or soprano pipistrelles.

7.1.4 Important foraging and commuting areas were identified as Cotting Burn, How Burn, Stopping Points 4, 7, 10-13, 16, and 18, between stopping points 18 and 19, and along the edges of Howburn Wood.

7.1.5 **Without mitigation**, it is considered that there would be a ***major negative*** impact on the recorded population of bats, considered to have ***medium conservation value***, thereby producing an overall ecological impact significance without mitigation of ***large adverse***.

7.2 It is anticipated that the magnitude of effect **with mitigation** will be reduced to ***slight-moderate adverse*** as following completion there will still be some measurable change in the site quality with an alteration to the characteristics on site, namely the severing of commuting habitat.

7.3 The final impact rating depends largely on the final detailed design; at present the location and design of bridges are at the most sensitive crossing points for bats and this should alleviate the impact greatly to **slight adverse**, on the condition that the structures allow bats to pass underneath the road. If this is not possible and bats are forced to fly over the new road the impact will be **moderate adverse**.

References

References

Bat Conservation Trust (2007) Bat Surveys; Good Practice Guidelines. Bat Conservation Trust, London.

Bat Conservation Trust (undated) A Year in the Life of a Bat. http://www.bats.org.uk/pages/a_year_in_the_life_of_a_bat.html

Bat Conservation Trust (undated) Bats and Lighting in the UK - Bats and the Built Environment Series.

Cowan, A. (2002) Giving Bats a Good Innings. A & E ArborEcology, Kent

Cowan, A (2003) Trees and bats. Arboricultural Association Guidance Note 1 (Second Edition). Arboricultural Association, Hants. http://www.trees.org.uk

DEFRA (2007) Hedgerow Survey Handbook. Department for Environment, Food, and Rural Affairs, London.

English Nature (2004) *Bat Mitigation Guidelines.* English Nature.

EU Habitats Directive (1992). Council Directive 92/43/EEC; on the Conservation of Natural Habitats and of Wild Fauna and Flora.

Highways Agency (2008) Nature Conservation Advice in Relation to Bats; Interim Advice Note 116/08.

HMSO (1994) Wildlife and Countryside Act 1981 (as amended). Chapter 69 http://www.opsi.gov.uk/RevisedStatutes/Acts/ukpga/1981/cukpga_19810069_en_1 The Stationary Office.

HMSO (1994). The Conservation (Natural Habitats & c.) Regulations 1994. http://www.opsi.gov.uk/si/si1994/Uksi_19942716_en_1.htm.The Stationary Office.

HMSO (1995). Biodiversity: The UK Steering Group Report. Tranch 2: Action Plans. http://www.ukbap.org.uk.The Stationary Office.

HMSO (1997). *The Hedgerows Regulations 1997.* Statutory Instrument 1997 No. 1160. Available from: http://www.opsi.gov.uk/si/si1997/19971160.htm

Institute of Ecology and Environmental Management (2006). *Guidelines for Ecological Impact Assessment.* IEEM.

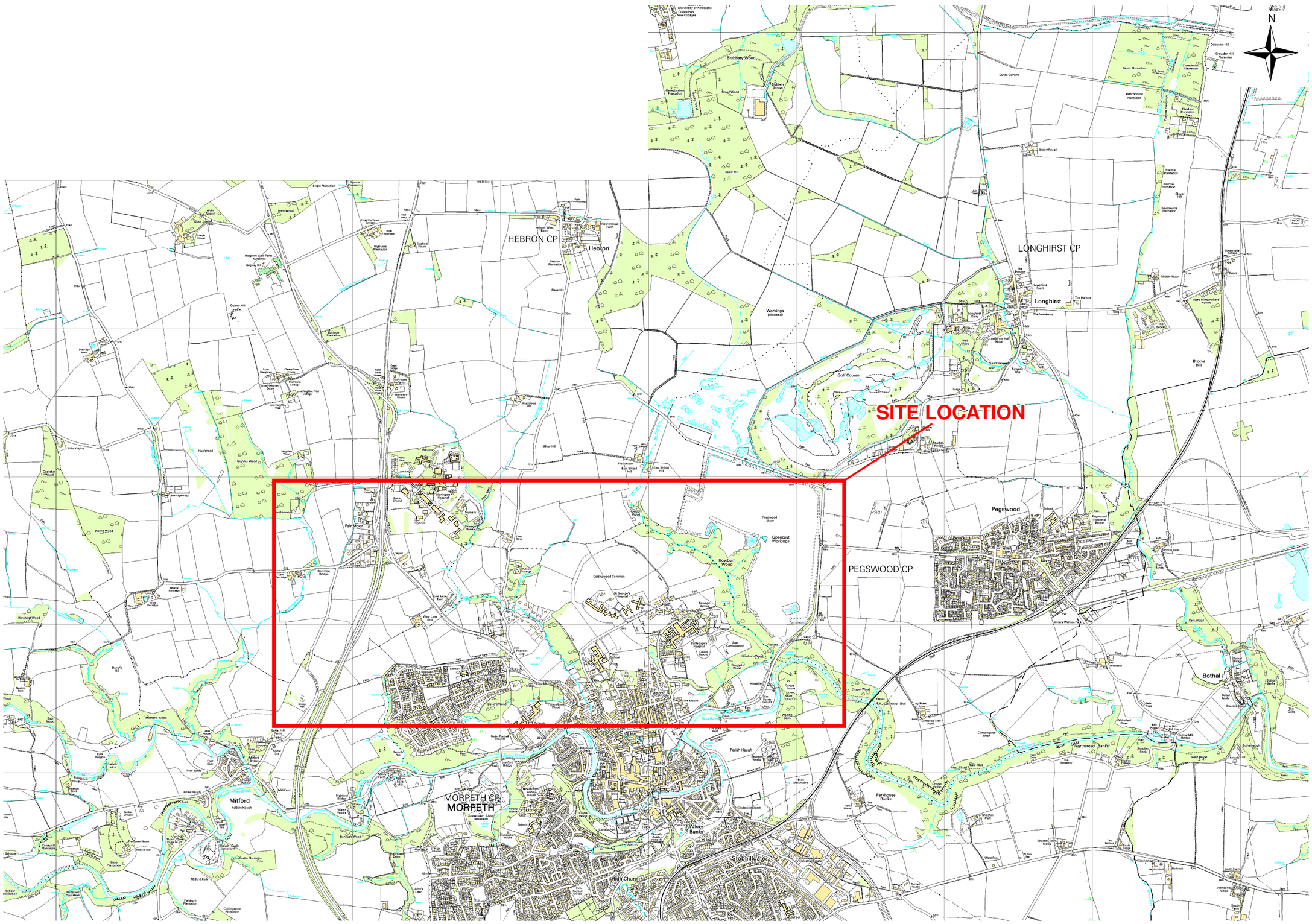
JNCC (2001) Habitat Management for Bats. Joint Nature Conservation Committee, Peterborough.

Mitchell-Jones, A.J, & McLeish, A.P. (Edited by) (2004) Bat Workers Manual, 3rd Edition. JNCC

Northumberland Bat Group (undated) Bats in Northumberland http://northumberlandbats.org.uk/index.php?option=com_content&view=article&id=45&Itemid=18

Figures

Figure 1 – Site Location Plan



REV	AMENDMENT	DWN	CHKD	APPR	DATE

CLIENT

NORTHUMBERLAND COUNTY COUNCIL

PROJECT

MORPETH NORTHERN BYPASS

TITLE

SITE LOCATION PLAN

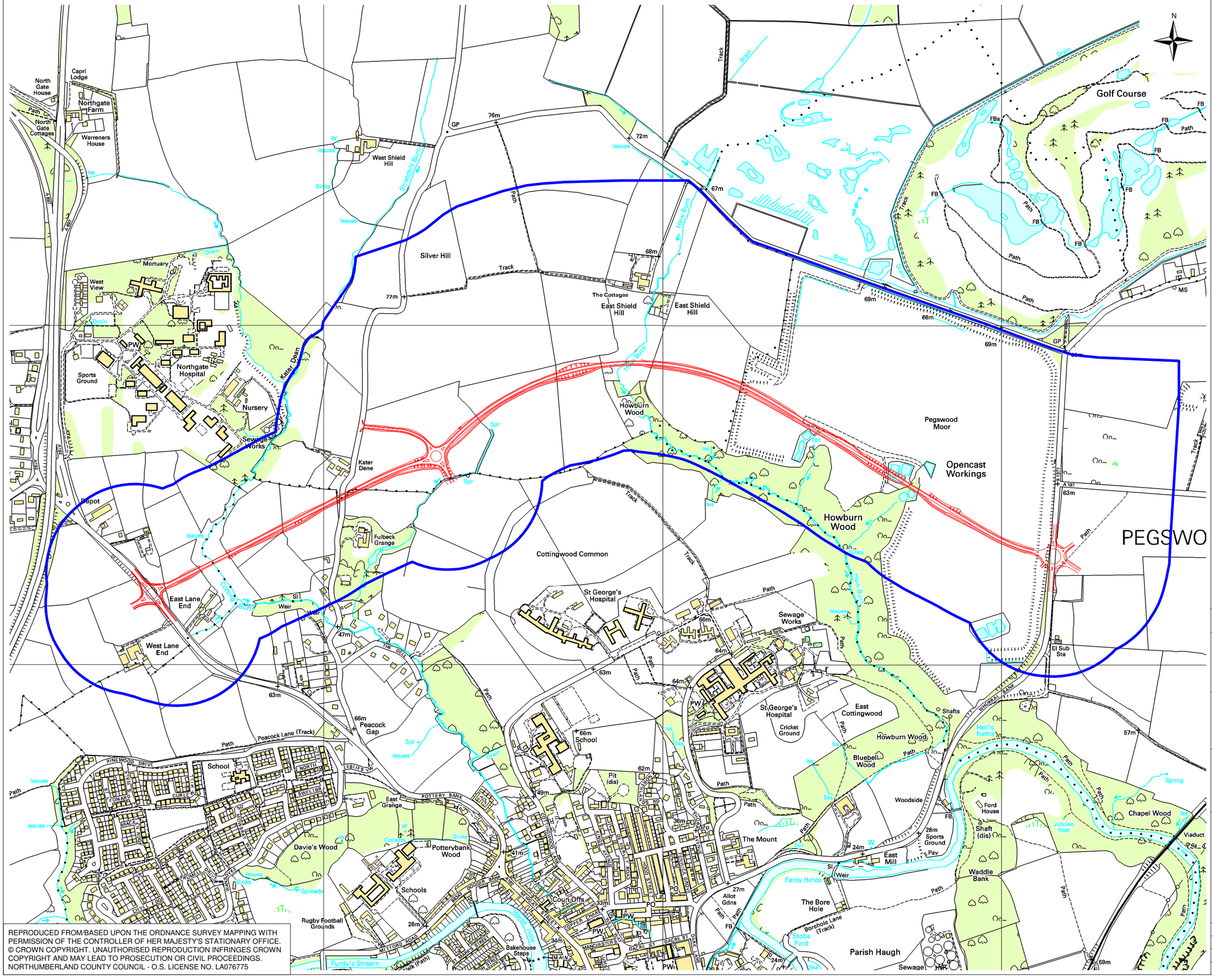
FABER MAUNSELL | AECOM

5th Floor, 2 City Walk, Leeds, LS11 9AR
Tel: 0113 391 6800 Fax: 0113 391 6899
Website: www.fabermaunsell.com

DRAWN BY	CHECKED BY	APPR. BY	DATE
DAM	KRH	ARB	OCT '08

SCALE	PROJ. NO.	FIGURE NO.	REV
1:25000	53101	01	A

Figure 2 – Proposed Bypass Route



KEY

- PROPOSED ROUTE
- ECOLOGICAL SURVEY AREA

REV	AMENDMENT	DWN	CHKD	APPR	DATE

CLIENT

NORTHUMBERLAND COUNTY COUNCIL

PROJECT

MORPETH NORTHERN BYPASS

TITLE

PROPOSED BYPASS ROUTE

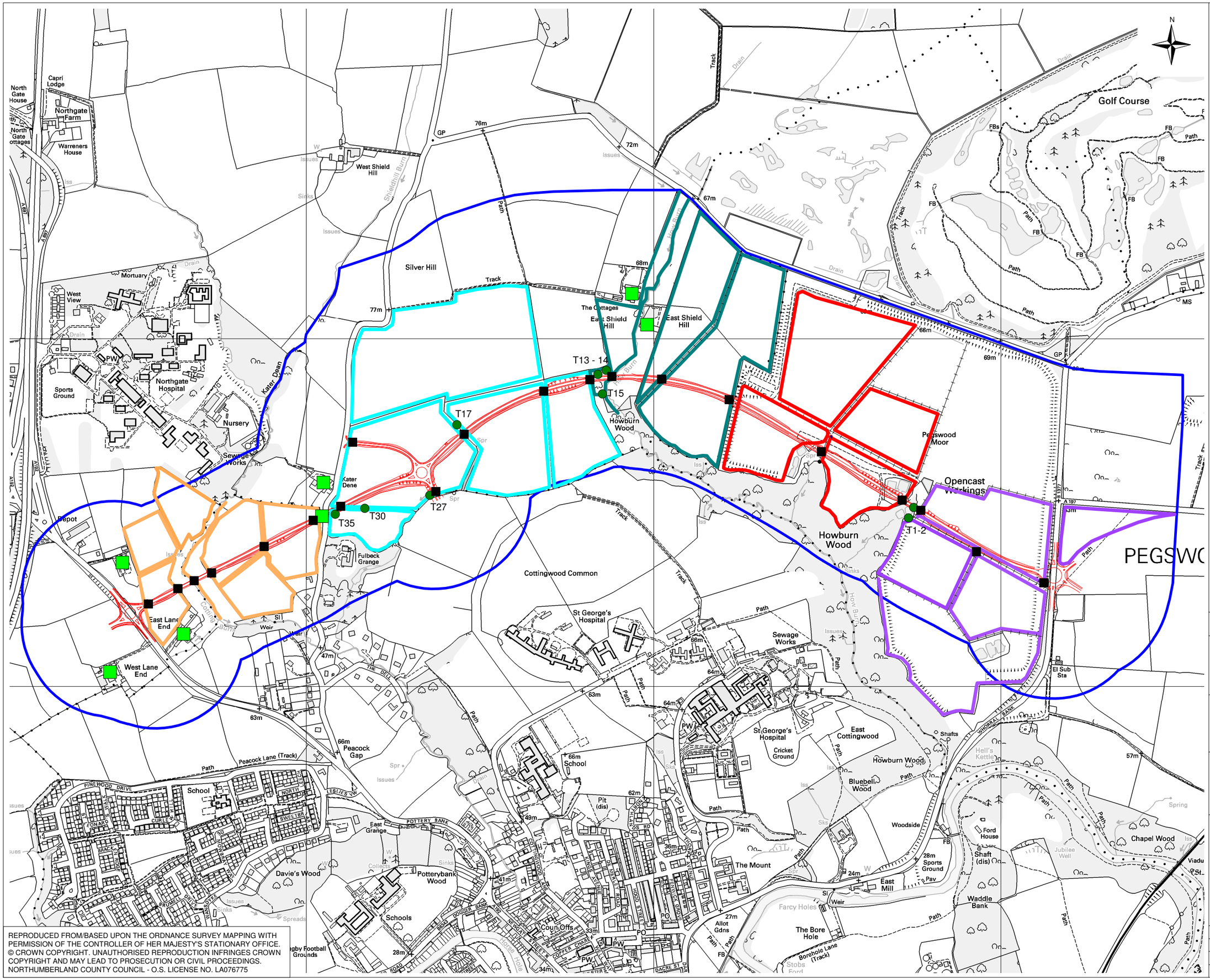
FABER MAUNSELL | AECOM

5th Floor, 2 City Walk, Leeds, LS11 9AR
Tel: 0113 391 6800 Fax: 0113 391 6899
Website: www.fabermaunsell.com

DRAWN BY	CHECKED BY	APPR. BY	DATE
DAM	HJV	LMK	AUG '07

SCALE	PROJ. NO.	FIGURE NO.	REV
1:10,000	53101	2	A

Figure 3 – Bat Survey Areas



KEY

- PROPOSED ROUTE
- ECOLOGICAL SURVEY AREA
- TRANSECT 1
- TRANSECT 2
- TRANSECT 3
- TRANSECT 4
- TRANSECT 5
- TREES SURVEYED
- BUILDINGS SURVEYED
- STOPPING POINT

REV	AMENDMENT	DWN	CHKD	APPR	DATE

CLIENT

NORTHUMBERLAND COUNTY COUNCIL

PROJECT

MORPETH NORTHERN BYPASS

TITLE

BAT SURVEY AREAS

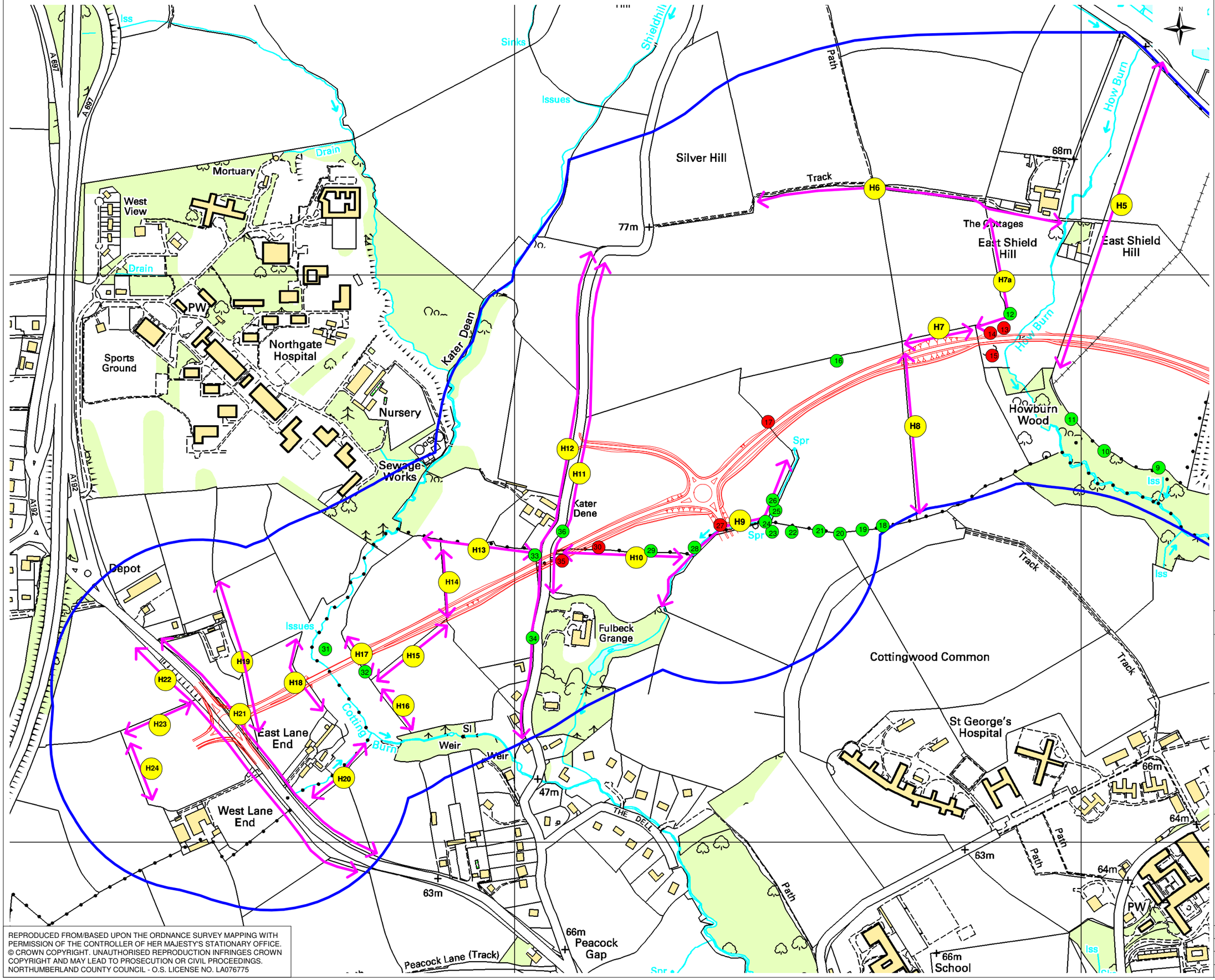
FABER MAUNSELL | AECOM

5th Floor, 2 City Walk, Leeds, LS11 9AR
Tel: 0113 391 6800 Fax: 0113 391 6899
Website: www.fabermaunsell.com

DRAWN BY	CHECKED BY	APPR. BY	DATE
EG	JRD	LMK	DEC '08

SCALE	PROJ. NO.	FIGURE NO.	REV
1:10,000	53101	3	B

Figure 4 – Bat Habitat Assessment



KEY

- PROPOSED ROUTE
- ECOLOGICAL SURVEY AREA
- TREES WITH BAT ROOST POTENTIAL
- TREES WITH BAT ROOST POTENTIAL SELECTED FOR FURTHER SURVEY
- H — HEDGEROW

REV	AMENDMENT	DWN	CHKD	APPR	DATE

CLIENT

NORTHUMBERLAND COUNTY COUNCIL

PROJECT

MORPETH NORTHERN BYPASS

TITLE

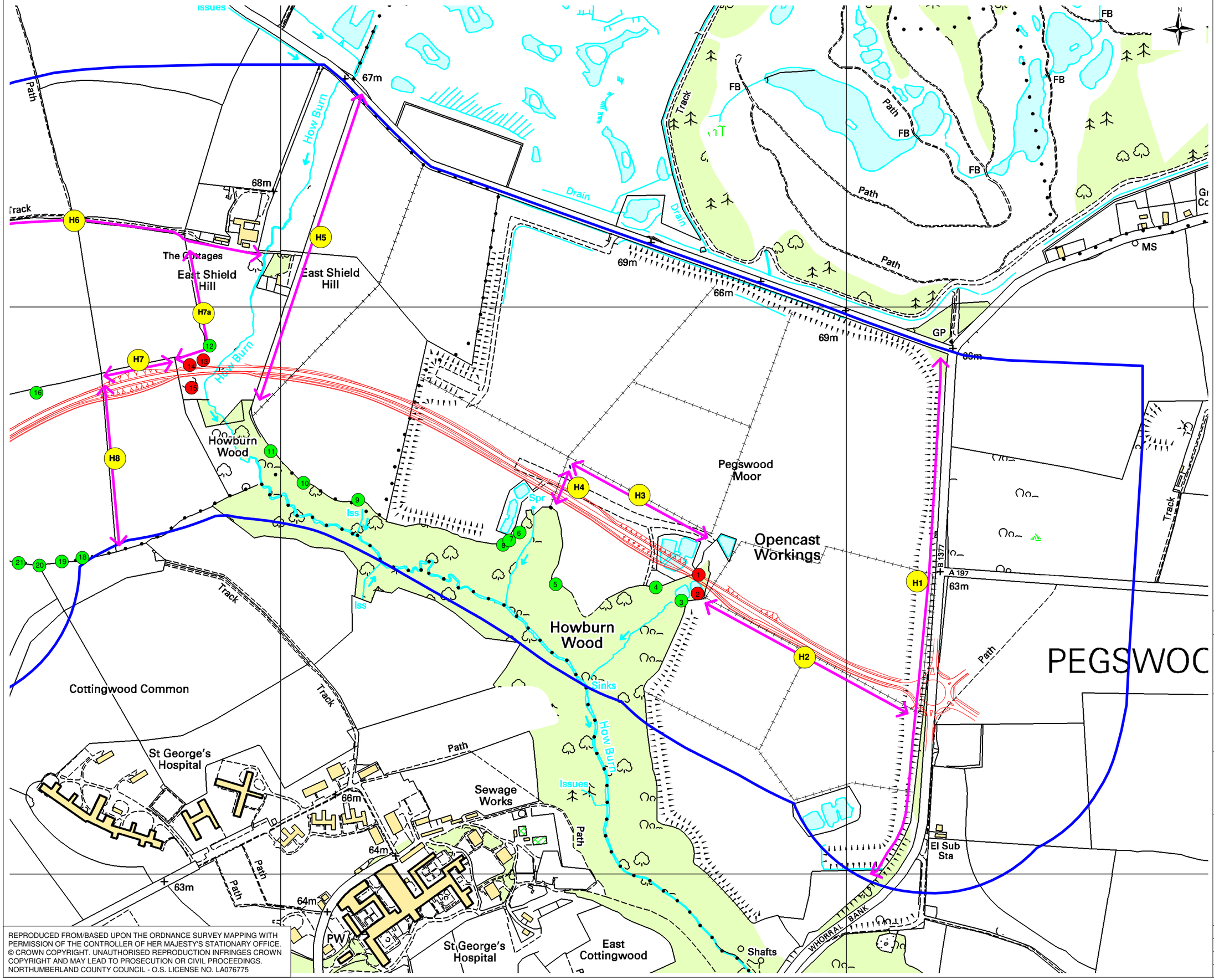
BAT HABITAT ASSSESSMENT
(MAP 1 OF 2)

FABER MAUNSELL | AECOM

5th Floor, 2 City Walk, Leeds, LS11 9AR
Tel: 0113 391 6800 Fax: 0113 391 6899
Website: www.fabermaunsell.com

DRAWN BY	CHECKED BY	APPR. BY	DATE
EG	LMK	LMK	DEC '08

SCALE	PROJ. NO.	FIGURE NO.	REV
1:6,000	53101	04	



KEY

- PROPOSED ROUTE
- ECOLOGICAL SURVEY AREA
- TREES WITH BAT ROOST POTENTIAL
- TREES WITH BAT ROOST POTENTIAL SELECTED FOR FURTHER SURVEY
- H — HEDGEROW

REV	AMENDMENT	DWN	CHKD	APPR	DATE

CLIENT
NORTHUMBERLAND COUNTY COUNCIL

PROJECT
MORPETH NORTHERN BYPASS

TITLE
BAT HABITAT ASSSESSMENT
(MAP 2 OF 2)

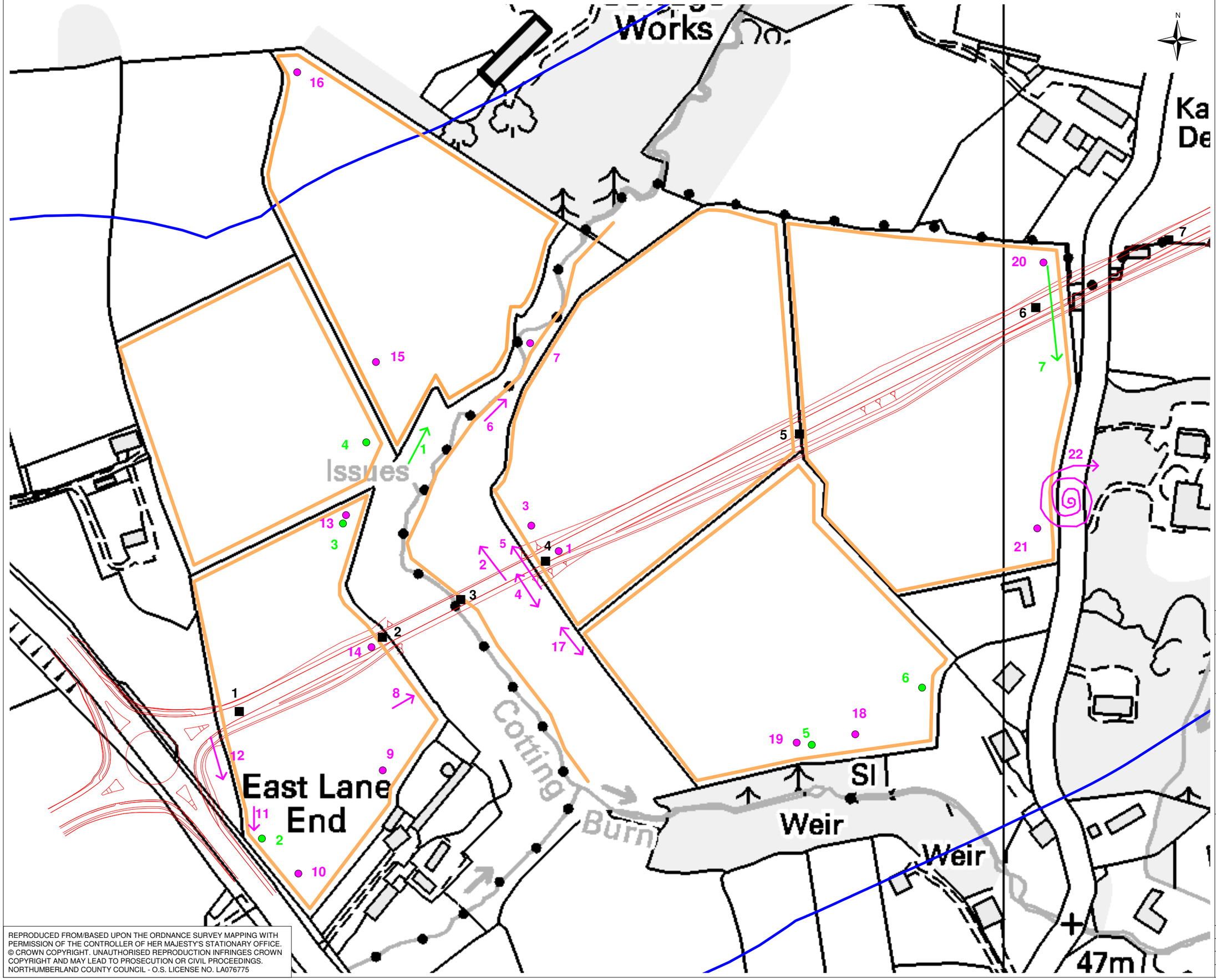
FABER MAUNSELL | AECOM

5th Floor, 2 City Walk, Leeds, LS11 9AR
Tel: 0113 391 6800 Fax: 0113 391 6899
Website: www.fabermaunsell.com

DRAWN BY	CHECKED BY	APPR. BY	DATE
EG	LMK	LMK	DEC '08

SCALE	PROJ. NO.	FIGURE NO.	REV
1:6,000	53101	04	

Figure 5 – Bat Activity Maps for Transects



REPRODUCED FROM/BASED UPON THE ORDNANCE SURVEY MAPPING WITH PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONARY OFFICE. © CROWN COPYRIGHT. UNAUTHORISED REPRODUCTION INFRINGES CROWN COPYRIGHT AND MAY LEAD TO PROSECUTION OR CIVIL PROCEEDINGS. NORTHUMBERLAND COUNTY COUNCIL - O.S. LICENSE NO. LA076775

KEY

- PROPOSED ROUTE
- ECOLOGICAL SURVEY AREA
- TRANSECT 1 - AREA WALKED
- ■ 1 STOPPING POINT AND REFERENCE NUMBER

JULY SURVEY RESULTS

- BAT FLIGHT LINE
- BAT HEARD BUT NOT SEEN.
- 1 TARGET NOTE REFERS TO RECORDING FORMS

SEPTEMBER SURVEY RESULTS

- BAT FLIGHT LINE
- BAT HEARD BUT NOT SEEN.
- 1 TARGET NOTE REFERS TO RECORDING FORMS

REV	AMENDMENT	DWN	CHKD	APPR	DATE

CLIENT

NORTHUMBERLAND COUNTY COUNCIL

PROJECT

MORPETH NORTHERN BYPASS

TITLE

BAT ACTIVITY MAPS FOR TRANSECTS TRANSECT 1

FABER MAUNSELL | AECOM

5th Floor, 2 City Walk, Leeds, LS11 9AR
Tel: 0113 391 6800 Fax: 0113 391 6899
Website: www.fabermaunsell.com

DRAWN BY	CHECKED BY	APPR. BY	DATE
EG	JRD	LMK	DEC '08

SCALE	PROJ. NO.	FIGURE NO.	REV
1:2,000	53101	Fig. 5 (Map 1 of 5)	B

Silver Hill

Track

77m

The Cottages

East Shield Hill

How Burn

Howburn Wood

Spr

Spr

Kater Dene

Fulbeck Grange

Track

KEY

- PROPOSED ROUTE
- ECOLOGICAL SURVEY AREA
- TRANSECT 2 - AREA WALKED
- ■ 1 STOPPING POINT AND REFERENCE NUMBER

JULY SURVEY RESULTS

- BAT FLIGHT LINE
- BAT HEARD BUT NOT SEEN.
- 1 TARGET NOTE REFERS TO RECORDING FORMS

SEPTEMBER SURVEY RESULTS

- BAT FLIGHT LINE
- BAT HEARD BUT NOT SEEN.
- 1 TARGET NOTE REFERS TO RECORDING FORMS

REV	AMENDMENT	DWN	CHKD	APPR	DATE

CLIENT

NORTHUMBERLAND COUNTY COUNCIL

PROJECT

MORPETH NORTHERN BYPASS

TITLE

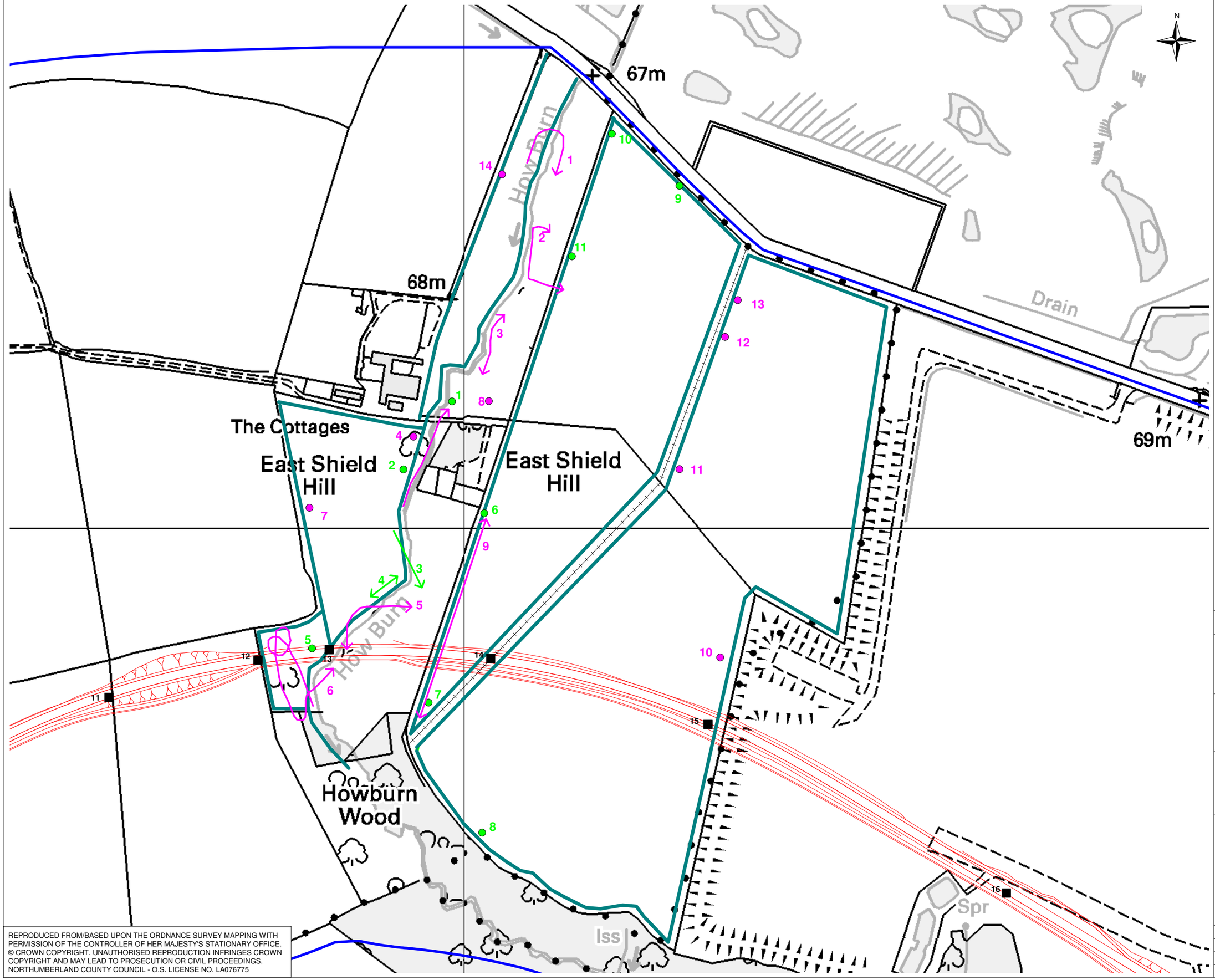
BAT ACTIVITY MAPS FOR TRANSECTS TRANSECT 2

FABER MAUNSELL | AECOM

5th Floor, 2 City Walk, Leeds, LS11 9AR
Tel: 0113 391 6800 Fax: 0113 391 6899
Website: www.fabermaunsell.com

DRAWN BY	CHECKED BY	APPR. BY	DATE
EG	JRD	LMK	DEC '08

SCALE	PROJ. NO.	FIGURE NO.	REV
1:3,000	53101	Fig. 5 (Map 2 of 5)	B



KEY

- PROPOSED ROUTE
- ECOLOGICAL SURVEY AREA
- TRANSECT 3 - AREA WALKED
- ■ 1 STOPPING POINT AND REFERENCE NUMBER

JULY SURVEY RESULTS

- BAT FLIGHT LINE
- BAT HEARD BUT NOT SEEN.
- 1 TARGET NOTE REFERS TO RECORDING FORMS

SEPTEMBER SURVEY RESULTS

- BAT FLIGHT LINE
- BAT HEARD BUT NOT SEEN.
- 1 TARGET NOTE REFERS TO RECORDING FORMS

REV	AMENDMENT	DWN	CHKD	APPR	DATE

CLIENT

NORTHUMBERLAND COUNTY COUNCIL

PROJECT

MORPETH NORTHERN BYPASS

TITLE

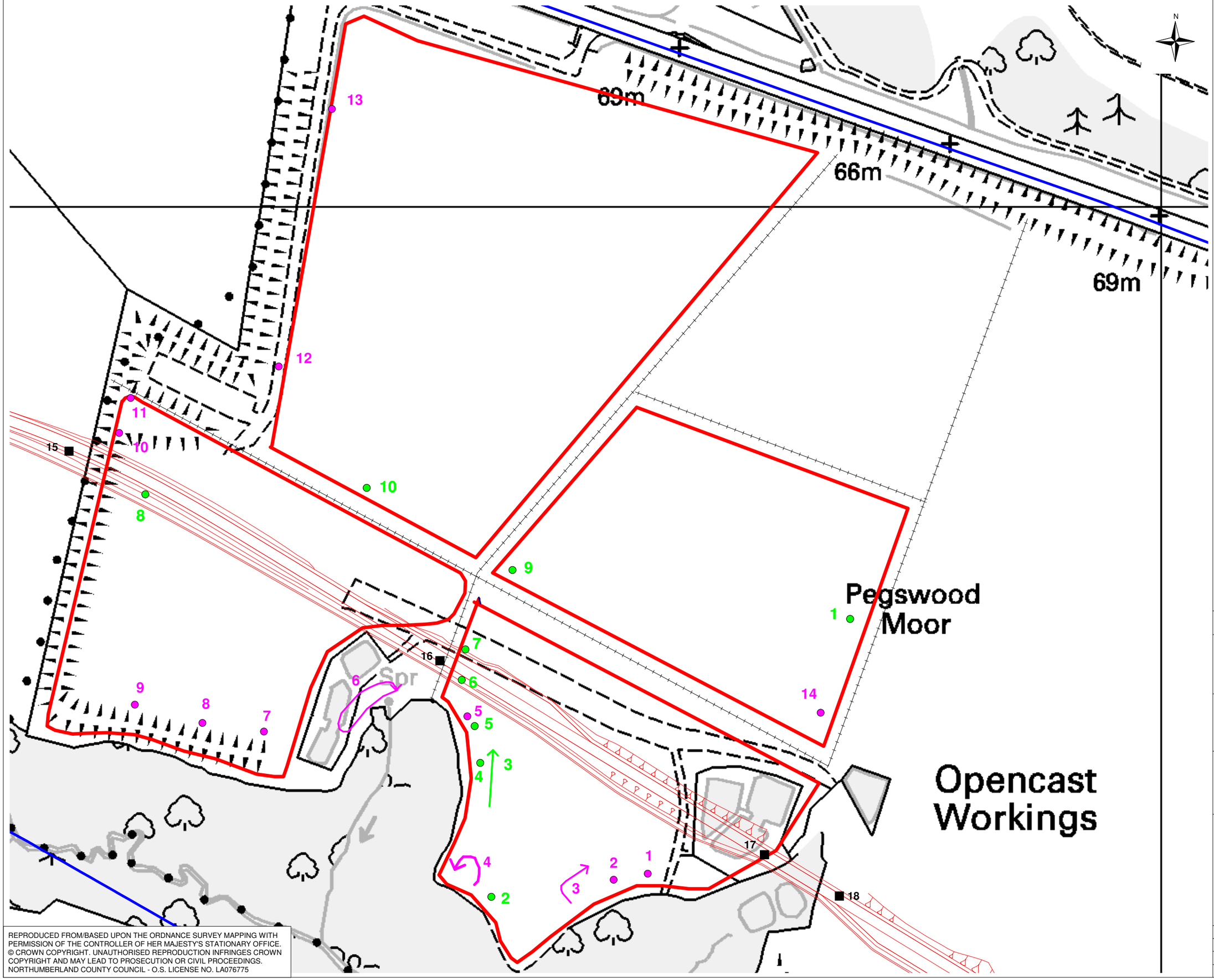
BAT ACTIVITY MAPS FOR TRANSECTS
TRANSECT 3

FABER MAUNSELL | AECOM

5th Floor, 2 City Walk, Leeds, LS11 9AR
Tel: 0113 391 6800 Fax: 0113 391 6899
Website: www.fabermaunsell.com

DRAWN BY	CHECKED BY	APPR. BY	DATE
EG	JRD	LMK	DEC '08

SCALE	PROJ. NO.	FIGURE NO.	REV
1:3,000	53101	Fig. 5 (Map 3 of 5)	B



KEY

- PROPOSED ROUTE
- ECOLOGICAL SURVEY AREA
- TRANSECT 4 - AREA WALKED
- ■ 1 STOPPING POINT AND REFERENCE NUMBER

JULY SURVEY RESULTS

- BAT FLIGHT LINE
- BAT HEARD BUT NOT SEEN.
- 1 TARGET NOTE REFERS TO RECORDING FORMS

SEPTEMBER SURVEY RESULTS

- BAT FLIGHT LINE
- BAT HEARD BUT NOT SEEN.
- 1 TARGET NOTE REFERS TO RECORDING FORMS

REV	AMENDMENT	DWN	CHKD	APPR	DATE

CLIENT

NORTHUMBERLAND COUNTY COUNCIL

PROJECT

MORPETH NORTHERN BYPASS

TITLE

BAT ACTIVITY MAPS FOR TRANSECTS
TRANSECT 4

FABER MAUNSELL | AECOM

5th Floor, 2 City Walk, Leeds, LS11 9AR
Tel: 0113 391 6800 Fax: 0113 391 6899
Website: www.fabermaunsell.com

DRAWN BY	CHECKED BY	APPR. BY	DATE
EG	LMK	LMK	DEC '08

SCALE	PROJ. NO.	FIGURE NO.	REV
1:5,500	53101	Fig. 5 (Map 4 of 5)	B

Opencast Workings

PEGSWC

A 197

B 1377

63m

Path

Sinks

How Burn

Path

WHORRAL BANK

El Sub Sta

Shafts

KEY

- PROPOSED ROUTE
- ECOLOGICAL SURVEY AREA
- TRANSECT 5 - AREA WALKED
- 1 STOPPING POINT AND REFERENCE NUMBER

JULY SURVEY RESULTS

- BAT FLIGHT LINE
- BAT HEARD BUT NOT SEEN.
- 1 TARGET NOTE REFERS TO RECORDING FORMS

SEPTEMBER SURVEY RESULTS

- BAT FLIGHT LINE
- BAT HEARD BUT NOT SEEN.
- 1 TARGET NOTE REFERS TO RECORDING FORMS

REV	AMENDMENT	DWN	CHKD	APPR	DATE

CLIENT

NORTHUMBERLAND COUNTY COUNCIL

PROJECT

MORPETH NORTHERN BYPASS

TITLE

BAT ACTIVITY MAPS FOR TRANSECTS
TRANSECT 5

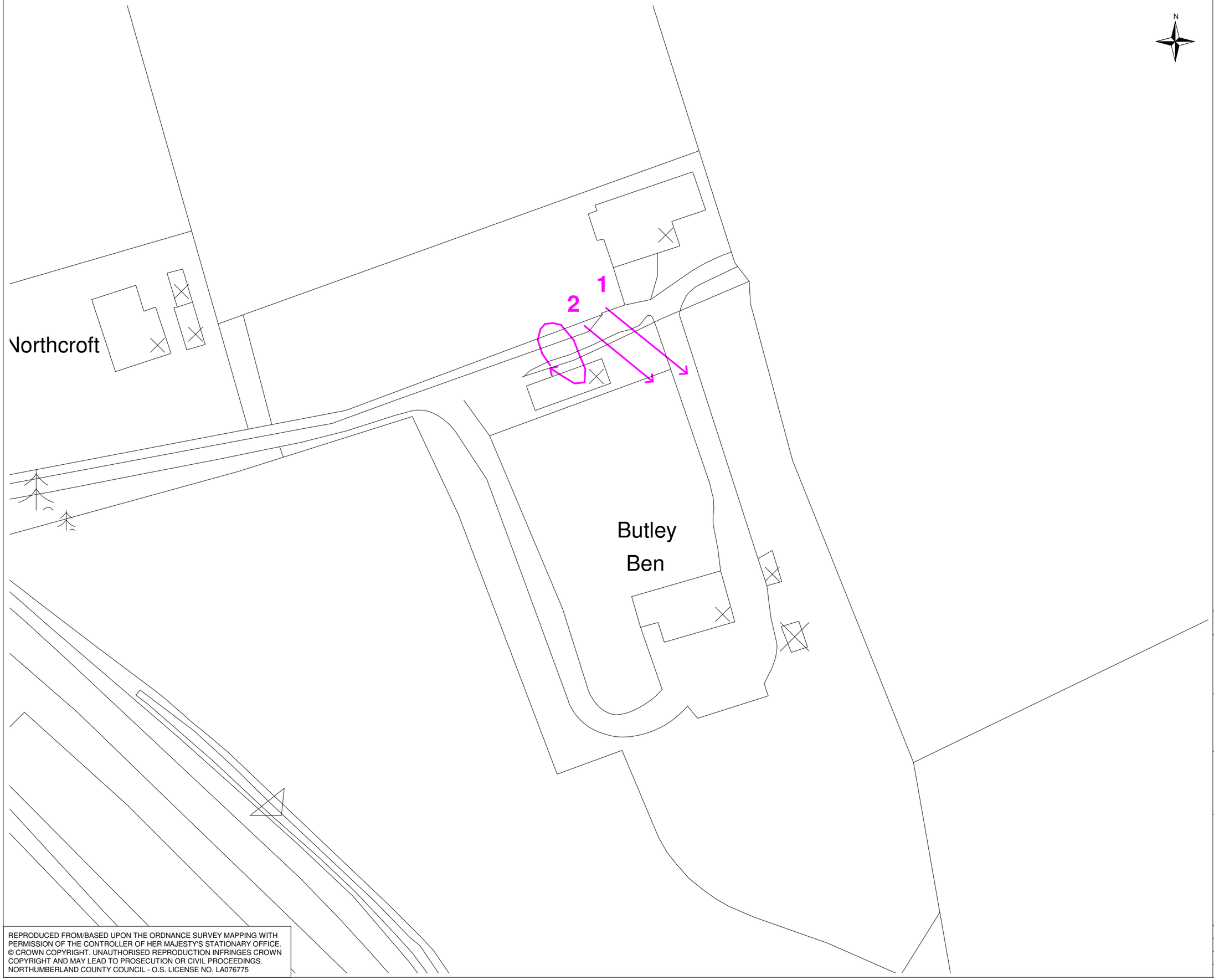
FABER MAUNSELL | AECOM

5th Floor, 2 City Walk, Leeds, LS11 9AR
Tel: 0113 391 6800 Fax: 0113 391 6899
Website: www.fabermaunsell.com

DRAWN BY	CHECKED BY	APPR. BY	DATE
EG	JRD	LMK	DEC '08

SCALE	PROJ. NO.	FIGURE NO.	REV
1:3,000	53101	Fig. 5 (Map 5 of 5)	B

Figure 6 – Bat Activity Maps for Buildings



KEY

SEPTEMBER SURVEY RESULTS

- BAT FLIGHT LINE
- BAT HEARD BUT NOT SEEN
- 1 TARGET NOTE REFERS TO RECORDING FORMS

REV	AMENDMENT	DWN	CHKD	APPR	DATE

CLIENT

NORTHUMBERLAND COUNTY COUNCIL

PROJECT

MORPETH NORTHERN BYPASS

TITLE

BAT ACTIVITY MAPS FOR BUILDINGS TO NORTH OF EAST LANE END

FABER MAUNSELL | AECOM

5th Floor, 2 City Walk, Leeds, LS11 9AR
Tel: 0113 391 6800 Fax: 0113 391 6899
Website: www.fabermaunsell.com

DRAWN BY	CHECKED BY	APPR. BY	DATE
EG/DAM	LMK	LMK	OCT '08

SCALE	PROJ. NO.	FIGURE NO.	REV
1:2,500	53101	06 (Map 1 of 6)	B

East Lane

End

Pump

1-6
(not seen)

7

3

5

4

1

6

2

8

6411

BM 60.55m

7

6509

60.4m

CR

N

KEY

SEPTEMBER SURVEY RESULTS (GJP)

BAT FLIGHT LINE

BAT HEARD BUT NOT SEEN

1 TARGET NOTE REFERS TO RECORDING FORMS

SEPTEMBER SURVEY RESULTS (EL)

BAT FLIGHT LINE

BAT HEARD BUT NOT SEEN

1 TARGET NOTE REFERS TO RECORDING FORMS

REV	AMENDMENT	DWN	CHKD	APPR	DATE

CLIENT

NORTHUMBERLAND COUNTY COUNCIL

PROJECT

MORPETH NORTHERN BYPASS

TITLE

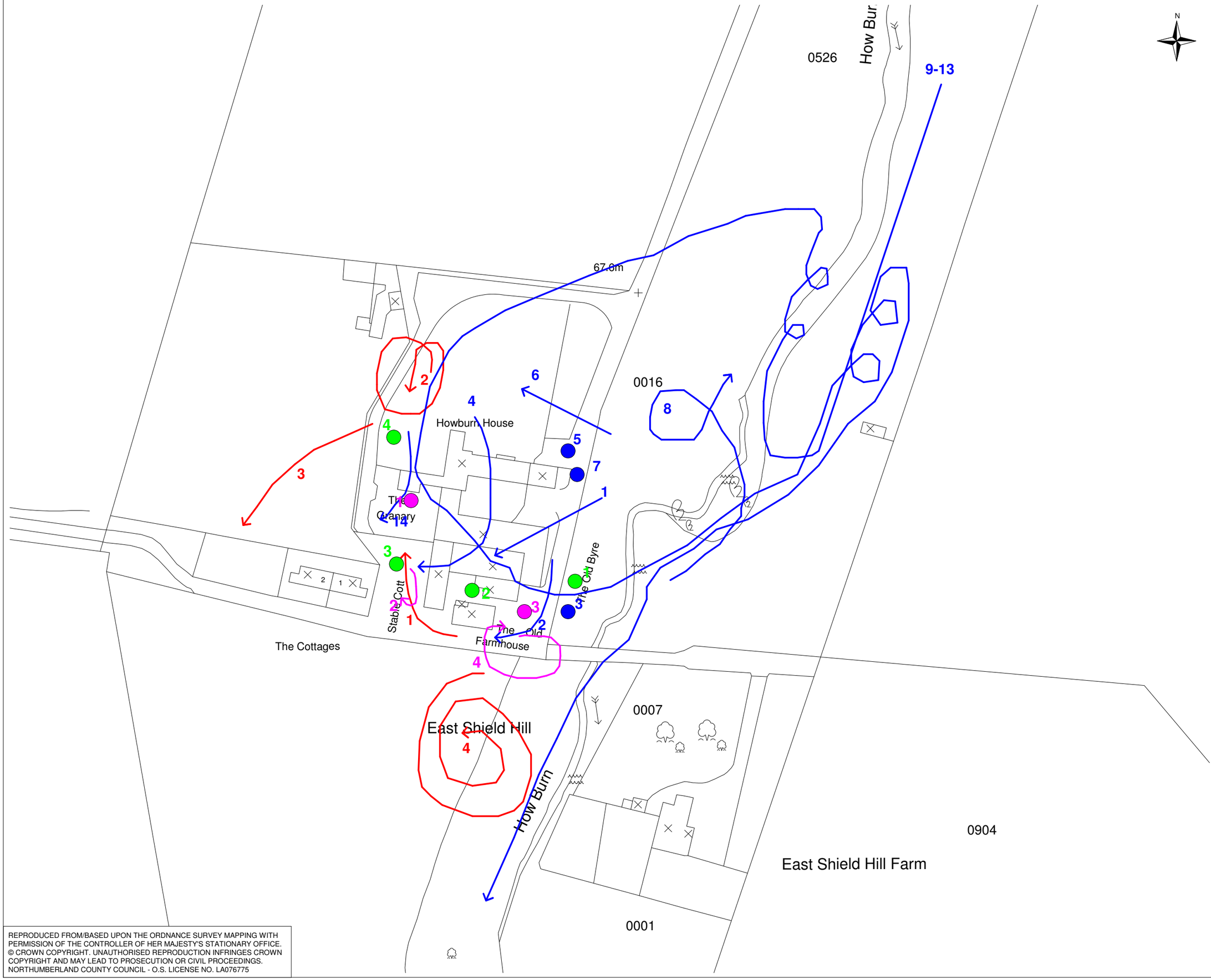
BAT ACTIVITY MAPS FOR BUILDINGS
EAST LANE END

FABER MAUNSELL | AECOM

5th Floor, 2 City Walk, Leeds, LS11 9AR
Tel: 0113 391 6800 Fax: 0113 391 6899
Website: www.fabermaunsell.com

DRAWN BY	CHECKED BY	APPR. BY	DATE
EG/DAM	LMK	LMK	OCT '08

SCALE	PROJ. NO.	FIGURE NO.	REV
1:5,000	53101	06 (Map 2 of 6)	B



KEY

JULY SURVEY RESULTS (JRD)

- BAT FLIGHT LINE
- BAT HEARD BUT NOT SEEN
- 1 TARGET NOTE REFERS TO RECORDING FORMS

JULY SURVEY RESULTS (EG)

- BAT FLIGHT LINE
- BAT HEARD BUT NOT SEEN
- 1 TARGET NOTE REFERS TO RECORDING FORMS

JULY SURVEY RESULTS (MW)

- BAT FLIGHT LINE
- BAT HEARD BUT NOT SEEN
- 1 TARGET NOTE REFERS TO RECORDING FORMS

JULY SURVEY RESULTS (DC)

- BAT FLIGHT LINE
- BAT HEARD BUT NOT SEEN
- 1 TARGET NOTE REFERS TO RECORDING FORMS

REV	AMENDMENT	DWN	CHKD	APPR	DATE

CLIENT

NORTHUMBERLAND COUNTY COUNCIL

PROJECT

MORPETH NORTHERN BYPASS

TITLE

BAT ACTIVITY MAPS FOR BUILDINGS
EAST SHIELD HILL (NORTH)

FABER MAUNSELL | AECOM

5th Floor, 2 City Walk, Leeds, LS11 9AR
Tel: 0113 391 6800 Fax: 0113 391 6899
Website: www.fabermaunsell.com

DRAWN BY	CHECKED BY	APPR. BY	DATE
EG/DAM	LMK	LMK	OCT '08

SCALE	PROJ. NO.	FIGURE NO.	REV
1:10,000	53101	06 (Map 3 of 6)	B

Stable Co

The Old Farmhouse

The

East Shield Hill

How Burn

0007

0001

3
6
1-5
(not seen)
5
6
2
2
1
1
1
5
4
3
8
9
6
5
3
6
2
4
7

East Shield Hill Farm

N

KEY

JULY SURVEY RESULTS (SD)

BAT FLIGHT LINE

BAT HEARD BUT NOT SEEN

1 TARGET NOTE REFERS TO RECORDING FORMS

JULY SURVEY RESULTS (SA)

BAT FLIGHT LINE

BAT HEARD BUT NOT SEEN

1 TARGET NOTE REFERS TO RECORDING FORMS

SEPTEMBER SURVEY RESULTS (Emily G)

BAT FLIGHT LINE

BAT HEARD BUT NOT SEEN

1 TARGET NOTE REFERS TO RECORDING FORMS

SEPTEMBER SURVEY RESULTS (JRD)

BAT FLIGHT LINE

BAT HEARD BUT NOT SEEN

1 TARGET NOTE REFERS TO RECORDING FORMS

REV	AMENDMENT	DWN	CHKD	APPR	DATE

CLIENT

NORTHUMBERLAND COUNTY COUNCIL

PROJECT

MORPETH NORTHERN BYPASS

TITLE

BAT ACTIVITY MAPS FOR BUILDINGS
EAST SHIELD HILL (SOUTH)

FABER MAUNSELL | AECOM

5th Floor, 2 City Walk, Leeds, LS11 9AR
Tel: 0113 391 6800 Fax: 0113 391 6899
Website: www.fabermaunsell.com

DRAWN BY	CHECKED BY	APPR. BY	DATE
EG/DAM	LMK	LMK	OCT '08
SCALE	PROJ. NO.	FIGURE NO.	REV
1:5,000	53101	06 (Map 4 of 6)	B

Dene

68.91m

0453

RH

RH

FF

Sheep Pen

FF

FF

4

1-6
(not seen)

Rose
Cottage

1-3,5,6
(not seen)

7

8

66.4m

N

KEY

PROPOSED ROUTE

SEPTEMBER SURVEY RESULTS (JRD)

BAT FLIGHT LINE

BAT HEARD BUT NOT SEEN

1 TARGET NOTE REFERS TO RECORDING FORMS

SEPTEMBER SURVEY RESULTS (Emily G)

BAT FLIGHT LINE

BAT HEARD BUT NOT SEEN

1 TARGET NOTE REFERS TO RECORDING FORMS

REV	AMENDMENT	DWN	CHKD	APPR	DATE

CLIENT

NORTHUMBERLAND COUNTY COUNCIL

PROJECT

MORPETH NORTHERN BYPASS

TITLE

BAT ACTIVITY MAPS FOR BUILDINGS
ROSE COTTAGE

FABER MAUNSELL | AECOM

5th Floor, 2 City Walk, Leeds, LS11 9AR
Tel: 0113 391 6800 Fax: 0113 391 6899
Website: www.fabermaunsell.com

DRAWN BY	CHECKED BY	APPR. BY	DATE
EG/DAM	LMK	LMK	OCT '08

SCALE	PROJ. NO.	FIGURE NO.	REV
1:5,000	53101	06 (Map 5 of 6)	B

N

KEY

SEPTEMBER SURVEY RESULTS (GJP)

BAT FLIGHT LINE

BAT HEARD BUT NOT SEEN

1 TARGET NOTE REFERS TO RECORDING FORMS

SEPTEMBER SURVEY RESULTS (EL)

BAT FLIGHT LINE

BAT HEARD BUT NOT SEEN

1 TARGET NOTE REFERS TO RECORDING FORMS

REV	AMENDMENT	DWN	CHKD	APPR	DATE

CLIENT

NORTHUMBERLAND COUNTY COUNCIL

PROJECT

MORPETH NORTHERN BYPASS

TITLE

BAT ACTIVITY MAPS FOR BUILDINGS
WEST LANE END

FABER MAUNSELL | AECOM

5th Floor, 2 City Walk, Leeds, LS11 9AR
Tel: 0113 391 6800 Fax: 0113 391 6899
Website: www.fabermaunsell.com

DRAWN BY	CHECKED BY	APPR. BY	DATE
EG/DAM	LMK	LMK	OCT '08

SCALE	PROJ. NO.	FIGURE NO.	REV
1:5,000	53101	06 (Map 6 of 6)	B

FABER MAUNSELL | AECOM

Appendices

Appendix A – Consultee Responses

Table 1 Summary of Consultee Responses

Contact	Organisation	Date contacted	Reponse received	Data provided
-	Environment Agency	09/07/08	Yes	No bat records
-	The EYE Project (Exploring Your Environment)	21/07/08	Yes	1 record of common pipistrelle (NZ 240867) from January 1998 (approximately 3km away from route)
Katherine Parkes	Natural England	09/07/08	Yes	No bat records Referred to the EYE Project
Veronica Carnell	Northumbria Mammal Group	09/07/08	Yes	Database unavailable Referred to the EYE Project
Sara Frisby	Northumberland Wildlife Trust	09/07/08	Yes	Informed that Howburn Woods (Ancient Woodland) has numerous bat roosts recorded. No further details provided.
Ruth Hadden	Northumberland Bat Group	09/07/08	Yes	See Table below

Table 2 Data received from Northumberland Bat Group

LOCATION	SPECIES	KM SQUARE	ROOST	HIB.	FORAGING	MAX NO.	LAST DATE	SITE DESCRIPTION
MORPETH4	?	NZ1984	*			1	1998	HOUSE
MORPETH5	?	NZ1984	*			1	1998	HOUSE
MORPETH6	?	NZ1985			*	1	2000	RIVER
MORPETH	?	NZ1986				1	1993	HOUSE
MORPETH9	?	NZ1986	*				2003	HOUSE
BEDLINGTON4	?	NZ2380				0	2001	FARM BUILDING
BOTHAL 1	?	NZ2487	*			5	1995	HOUSE
BOTHAL 2	?	NZ2487	*			1	1996	HOUSE
MITFORD	?PIP	NZ1786	*				2007	HOUSE
PIGDON	BLE	NZ1588	*			13	2006	HOUSE
MORPETH10	DAU	NZ1886			*	5	2004	WOOD
MITFORD1	NAT	NZ1685	*	*		4	2003	CHURCH
MORPETH10	NAT	NZ1886			*	3	2004	WOOD
ESHOTT3	NAT	NZ2097	*			40	2000	STABLE
HARTFORD4	NOC	NZ2480	*			1	1998	TREE
BLAGDON	NOC	NZ2276			*	4	2006	COMMUTING
HARTFORD2	PIP	NZ2480	*			11	1998	HALL
MITFORD	PIP	NZ1785	*			2	2006	HOUSE
MORPETH	PIP	NZ1986	*			66	1994	HOUSE
MORPETH	PIP	NZ2084	*			36	1986	HOUSE
MORPETH8	PIP	NZ2084			*	1+	2003	POND
HEPSCOTT	PIP	NZ2284	*			1	1998	PARK
GUIDEPOST	PIP	NZ2485	*			100	1994	HOUSE
MORPETH10	PIP45	NZ1886			*	2	2004	WOOD
MORPETH	PIP45	NZ2084	*			1	2006	HOUSE
MORPETH7	PIP55	NZ1985	*			618	2007	HOUSE
MITFORD1	PIP55	NZ1685	*			10	2001	CHURCH
HARTFORD	W/B	NZ2480	*			32	1992	HOUSE

HARTFORD3	W/B	NZ2480	*			16	1998	HALL
MORPETH4	?	NZ1984	*			1	1998	HOUSE
MORPETH	BLE	NZ1782	*			20	2007	HOUSE

Key:
HIB = Hibernating
PIP = Pipistrelle species
PIP45 = Common pipistrelle
PIP55 = Soprano pipistrelle
BLE = Brown long-eared
DAU = Daubenton's bat
NAT = Natterer's bat
W/B = Whiskered/Brandt's bat

Appendix B – Tree Roost Assessment

Assessment of Trees as Potential Bat Roosts

Site Name: Morpeth Bypass **Date: 30/07/08**
Recorders: Sarah Dale/Emma Grubb

Tree no.	Decay	Species	DBH	Areas			
				No.	Type	Direction	Height
1	4	*Quercus robur*	60cm	1	Peeling bark	N	2-4m
				2	Peeling bark	SE	6-8m
				3	Dead branch	NW	12m
2	1	*Q.robur*	70cm	No obvious holes but mature with dense vegetation. Can't assess upper branches			
3	1	*Q.robur*	80cm	No obvious holes but mature with dense vegetation. Can't assess upper branches			
4	2	*Fraxinus excelsior*	60cm	1	Hollow	NW	8m
5	3	*Q. robur*	120cm	1	Hollow/crevice	N	9m
				2	Crack	N	15m
6	2	*Q.robur*	150cm	1	Crack	S	10m
7	2	*Q.robur*	12cm	1	Crack	NW	7-12m
8	2	*F.excelsior*	110cm	1	Crack	N	4m
9	4	*Q.robur*	50cm	1	Peeling bark	NE/N	8m
10	2	*?Q.petraea*	150cm	1	Crack/bark	N	8m
11	2	*Q.petraea*	130cm	1	Bark flaking	S	3m
				2	Knot hole	S	3m
				3	Split branch	N	3m
				4	Split branch/bark	S	7m
12	2	*?Q.petraea*	100cm	1	Split	NW	5m
				2	Broken branch	N	9m
				3	Flaking bark	NE	10m
13	1	*Q.petraea*	150cm	No obvious features – mature oak. In line of route and not all assessable from ground.			
14	1	*Q.petraea*	200cm	1	Split trunk	N	1-4m
				2	Split branch/bark	NW	1-3m
15	1	*Q.petraea* (+ 3 others nearby). 1 most likely = furthest to E	120cm	1	Holes	N	8m
				2	Crack	NW	15m
16	1	*F. excelsior*	120cm	1	Knot hole/crack	S	10m

				2	Knothole	E	16m
17	1	*Q. robur*	180cm	No obvious features – mature oak. Can't assess upper reaches. Some are broken.			
18	1	*Q. robur*	100cm	1	Knothole	E	12m
19	1	*Q. robur*	80cm	1	Lg gash in trunk	E	13-14m
20	1	*Q. robur*	120cm	1	Hole (broken branch)	N	9m
				2	Crack	W	14m
21	2	*Q. robur*	100cm (x2 trunks)	1	Lg crack	N	1-6m
				2	Lg crack	E	6-8m
				3	Split	NW	10m
22	1	*Q. robur*	120cm	1	Crack	NW	11m
23	1	*Q.robur*	170cm (X2)	No obvious features but v leafy mature oak.			
24	1	*Q.robur*	120cm	1	Crack	W	12m
				2	Ivy	W	0-10m
25	1	*Q.robur*	100cm	1	Ivy	All	0-15m
26	1	*Q. robur*	220cm	1	Ivy	All	5-20m
				Mature oak – may be other features			
27	1	*Fraxinus excelsior*	?	1	Dense ivy	All	0-30m
28	1	*F.excelsior* (and *Quercus* to E also some potential)	200cm	1	Flaking bark	E	4m
				2	Crack/ hole	E	12m
29	1	*F. excelsior*	150cm	1	Hole	NE	9m
30	1	*F. excelsior*	200cm	1	Hole	S	6-7m
31	1	*F.excelsior*	100cm	1	Hole	N	10m
				2	Broken branch	N	12m
32	1	*Q. robur*	200cm	Mature pollarded tree. May be holes where pollarded – can't assess from ground.			
33	1	*Q. robur*	110cm	1	Flaking bark	E	8-10m
34	2	*Q. robur* (pollarded)	250cm	1	Hole	E	5m
				2	Broken branch	SE	5m
				3	Ivy	All	1-15m
35	2	*Q. robur*	170cm	1	Broken branch	S	8m
				2	Ivy	All	7-12m
36	1	*Q. robur*	140cm	1	Ivy	All	0-15m
				2	Broken branch	SW	7m
				3	Crack/crevice	N	13m

***DBH = diameter at breast height; those shaded are directly along proposed bypass route.**

Appendix C – Hedgerow Assessment

Project: Morpeth Northern Bypass (ILEE53101)
Date: July 2008
Task: Hedgerow Assessment
Recorders: Sarah Dale
Emma Grubb

Hedgerow Number[6]	Assessment notes
H1	▪ Adjacent to B1377 ▪ Gappy – 10%+ ▪ Severed by new roundabout ▪ Lit by new streetlights (no cowls present) ▪ Newly planted woodland adjacent to new roundabout = potential foraging in 5+ years. ▪ Maintained
H2	▪ Newly planted hedgerow ▪ Early mitigation for bypass ▪ Native species - planted 5m apart ▪ Will link to Howburn Wood (coniferous woodland) NB – Also planted either side of Howburn Wood to compensate for loss due to bypass
H3	▪ As H2
H4	▪ As H2
H5	▪ Part ornamental hedge near to house ▪ Mainly intact ▪ 1 – 1.5m high ▪ Joins to Howburn Wood to south
H6	▪ Gappy/patchy near houses ▪ Predominately hawthorn ▪ 1m high ▪ Broken up with nettles/willowherb
H7	▪ Gappy -40m gap in one section ▪ 2m high ▪ Predominately hawthorn with dogrose, hazel, bracken and brambles
H7a (to gap)	▪ 1 – 1.5m high ▪ Flailed but continuous ▪ Southern end = Hazel/blackthorn to 3 metres
H8	▪ Intact ▪ Predominately hawthorn with dogrose, elder ▪ 3m high
H9	▪ Unmanaged hedgerow/mature trees ▪ Continuous ▪ Hawthorn, ash and oak
H10	▪ Unmanaged – mature trees ▪ Oak, ash, hawthorn, holly, sycamore ▪ Continuous
H11	▪ Predominately hawthorn with mature sycamore, elder, hazel and blackthorn, with honeysuckle, ivy, bramble and dog rose growing through ▪ 2m high ▪ Runs along road
H12	▪ Species rich (best hedge surveyed) ▪ Oak, alder, elder, blackthorn, dogrose

[6] Refer to Figure 4 for hedgerow locations

Hedgerow Number[6]	Assessment notes
	▪ Hawthorn dominated ▪ Adjoins new house ▪ 2.5m high ▪ Gappy near bungalow (Rose Cottage) ▪ Southern section of hedge runs along road
H13	▪ Mainly fencing ▪ Very gappy ▪ Hawthorn with mature ash and oak ▪ Joins to woodland (unnamed)
H14	▪ Hawthorn ▪ Gappy ▪ 1.5 – 2m
H15	▪ Hawthorn ▪ Flailed ▪ Gappy – large gaps ▪ 1.5m high
H16	▪ Predominately hawthorn ▪ Close proximity to watercourse (Cotting Burn) ▪ 1.5m high
H17	▪ Predominately hawthorn with mature sycamore ▪ Gappy ▪ 1.5 – 2m high
H18	▪ Predominately hawthorn ▪ Few gaps (where fencing) ▪ 1.5 – 2m high ▪ Adjoins East Lane End Farm
H19	▪ Hawthorn ▪ Gappy ▪ 1.5 – 2m high
H20	▪ Hawthorn/hazel/holly ▪ In a ditch ▪ Adjoins mature trees connected to house
H21	▪ Hawthorn/elder ▪ Gappy (gates) and flailed ▪ 1.5m high ▪ By A192
H22	▪ As H21
H23	▪ Predominately hawthorn ▪ Not as heavily managed ▪ 1.5 – 2m high ▪ Continuous
H24	▪ Predominately hawthorn ▪ 1m high ▪ Failed ▪ Occasional gaps ▪ Adjoins farm

Appendix D – Scheme Proposal

CONTRACT DRAWING No.

DRAWING SIZE A1

NORTHUMBERLAND COUNTY COUNCIL

NOTES

1. THE ROUTE OF THE CENTRAL SECTION 'IN GENERAL' IS FIXED BY THE LOCATION OF THE LANE END AND WHORRAL BANK ROUNDABOUTS AND THE ALIGNMENT THROUGH THE RESTORED PEGSWOOD MOOR OPENCAST SITE. HOWEVER THE REMAINING SECTIONS OF THE ALIGNMENT SHOWN ARE INDICATIVE AT THIS STAGE. THE EXTENT OF THE DEVELOPMENTS OFF THE ST. GEORGE'S ROUNDABOUT ARE UNKOWN AT PRESENT.

KEY

- EXISTING PUBLIC RIGHT OF WAY
- GATE
- PROPOSED CARRIAGEWAY
- PROPOSED EARTHWORKS
- PROPOSED SHARED CYCLEWAY/FOOTWAY
- FORMER PEGSWOOD MOOR OPENCAST SITE. NOW RESTORED
- EXISTING WOODLAND
- PROPOSED BROWNFIELD SITE
- PROPOSED OFFICE DEVELOPEMENT
- PROPOSED EMPLOYMENT LAND

REVISION	By	Date	Rev.

Drawing Status: PRELIMINARY

Client: NORTHUMBERLAND COUNTY COUNCIL
COUNTY HALL, MORPETH.
NORTHUMBERLAND. NE61 2EF Tel. 01670 533000

Job Title: A1 – SOUTH EAST NORTHUMBERLAND LINK ROAD
MORPETH NORTHERN BYPASS

Drawing Title: SCHEME PROPOSALS

Scales 1:5000

NORTHUMBERLAND COUNTY COUNCIL
OPERATIONAL SERVICES

Drn	Date	Checked	Passed
PF	APR '07		

Drawing Number: 2729/2/A197/1/7 Rev

Negative Number/Job Number/File Number Rev

Appendix E – Bat Survey Recording Forms

Transects

DUSK SURVEY	**Recorder(s):** Jennifer Davis (JRD) & Emma Grubb (EG)
Date:	30/07/08
Arrival time:	21.00
Departure time:	23.55

Qualifications, **Experience and Relevant Licenses**: JRD: Four years bat surveying experience EG: Two months surveying with FM, BCT Intro to Bats training (April), WYBG Bat Care and Roost Visitor training (July)
Site: Transect 1
Project and Reference: - Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	N/A	**Sunset**:	21.14
Wind speed	0 – No breeze	**Air temperature (C)**	16°C
Weather (rain etc): 80% cloud, calm evening. Has been a very mild, sunny day.			
Habitat / corridors / nearby water bodies and general habitat: Pasture, stream (Cotting Burn) woodland, mature trees, hedgerows, East Lane End farm			

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
21.35	TN1 - Stood outside large mature sycamore	Daubenton's	May have left tree roost	2
21.37	TN1 - Stood outside large mature sycamore	Common pipistrelle	Commuting	1
21.38	TN1 - Nr large mature sycamore	Soprano pipistrelle	Commuting	1
21.29	TN1 - Nr large mature sycamore	Common & Soprano pipistrelle	Commuting	2
21.43	TN1 - Nr large mature sycamore	Noctule	Commuting	1
21.40	TN2 - Nr large mature sycamore	Common pipistrelle	Commuting	1
21.42	TN2 - Nr large mature sycamore	Common pipistrelle	Unknown	1
21.49	TN3 - Nr large mature sycamore – not seen	Common pipistrelle	Commuting	1
21.55	TN4 - By stream	Common pipistrelle	Commuting	2
22.00	TN5 - Moving along hedge	Common pipistrelle	Foraging	up to 4
22.04	TN6	Daubenton's and Common pipistrelle	Unknown	3 at least (2 Pips)
22.09	TN7	Soprano pipistrelle	Foraging	1
22.18	TN8	Common pipistrelle	Unknown	1
22.21	TN9 - Not seen	Common pipistrelle	Unknown	1
22.24	TN10 - Not seen	Soprano pipistrelle	Unknown	1
22.27	TN11 - Commuting along hedgerow	Common pipistrelle	Commuting	1
22.36	TN12 - Commuting along hedgerow	Soprano pipistrelle	Commuting	1
22.41	TN13 - Not seen	Common pipistrelle	Commuting	1
22.48	TN14 - Not seen	Daubenton's	Commuting	1
22.56	TN15 - Not seen	Common pipistrelle	Commuting	1
23.01	TN16 - Not seen	Daubenton's	Commuting	1
23.14	TN17 -Not seen but heard a few times up and down hedge	Common pipistrelle	Foraging	1
23.23	TN18 - Not seen	Common and Soprano pipistrelle	Commuting	1
23.30	TN19 - Not seen	Common pipistrelle	Commuting	1

23.43	TN20 - Not seen	Daubenton's	Commuting	1
23.51	TN21 - Not seen	Common pipistrelle	Commuting	1
23.55 – 00.00	TN22 - Feeding between hedgerow and trees, across the row	Common pipistrelle	Foraging	3
23.57	Passed by whilst at TN22	Daubenton's	Commuting	1

Objective Evidence of Species e.g. Sonograms

Analysed by JRD using Batsound November 2008

Additional Comments / Observations

DUSK SURVEY	**Recorder(s):** Jennifer Davis (JRD) and Emily Godsiffe (Emily G)
Date:	23/09/08
Arrival time:	18.50*
Departure time:	21.00

Qualifications, Experience and Relevant Licenses: Jenny – Four years bat survey experience Emily – One month bat survey experience

Site: Transect 1

Project and Reference: Morpeth Northern Bypass/53101IIEE

Weather conditions			
Sunrise:	N/A	**Sunset:**	19.05
Wind speed:	Calm	**Air temperature (C):**	14°C

Weather (rain etc): Rained just prior to survey. Some drizzle during survey

Habitat / corridors / nearby water bodies and general habitat:
Small watercourse but primarily pasture fields, some bordered by woodland mainly fences but some hedges (defunct) between.

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
19.34	TN1 - Along hedge	Soprano pipistrelle	Commuting	1
19.48	TN2 - Not seen. Very quick/brief call	Daubenton's	Commuting	1
19.53	TN3 - Not seen	Soprano pipistrelle	Foraging	1
20.00	TN4 - Not seen	Common pipistrelle	Foraging	1
20.32	TN5 - Not seen (sounds distant)	Common pipistrelle	Foraging	1
20.35	TN6 - Possibly same bat as TN5	Common pipistrelle	Foraging	1
20.43	TN7 - Up and down hedge	Common pipistrelle	Foraging	1

Objective Evidence of Species e.g. Sonograms

Calls analysed by JRD using Batsound on 24/11/08

Additional Comments / Observations

* Started survey late due to downpour of rain just as survey was due to start.

DUSK SURVEY	**Recorder(s)**: Sarah Dale (SD) and Simon Armistead (SA)	**Qualifications, Experience and Relevant Licenses**: SD: 2 years bat surveying experience. SA: 2 previous bat surveys
Date:	30/07/2008	
Arrival time:	21:05	**Site**: Transect 2
Departure time:	23:31	**Project and Reference**: Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	N/A	**Sunset:**	21:15
Wind speed	Calm	**Air temperature (C)**	12°C
Weather (rain etc): No recent rain			
Habitat / corridors / nearby water bodies and general habitat: Linked hedgerows. Numerous mature trees with bat potential. Several suitable roost buildings.			

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
21:54	Seen along hedgerow (TN1)	Soprano pipistrelle	Commuting	1
21:58	TN2 - Not seen	Common pipistrelle	Commuting	1
21:59	Seen along hedgerow (TN1)	Soprano pipistrelle	Commuting	1
22:00	seen along hedgerow (TN1)	Common pipistrelle	Commuting	1
22:02	TN1 - Not seen	Common pipistrelle	Commuting	1
22:03	TN1 - Not seen	Noctule	Commuting	1
22:10	TN3	Common pipistrelle	Foraging	2
22:11	TN4	Soprano pipistrelle	Foraging	1
22:12	TN4	Common pipistrelle	Commuting	1
22:13	TN4	Soprano pipistrelle	Commuting	1
22:13	TN4	Natterer's	Commuting	1
22:14	TN4	Common pipistrelle	Commuting	1
22:15	TN4	Daubenton's	Commuting	1
22:16	TN4	Daubenton's	Commuting	1
22:21	TN5	Common pipistrelle	Commuting	1
22:23	TN6	V quiet Daubenton's	Commuting	1
22:26	TN7 – Not seen	Common pipistrelle	Foraging	1
22:30	TN8 – Not seen	Daubenton's	Commuting – North	1
22:36	TN9	Common pipistrelle	Foraging	1
22:37	Not seen – nr TN9	Common pipistrelle	v	1
22:37	Not seen – nr TN9	Noctule/Leisler's	Commuting	1
22:40	TN10	Soprano pipistrelle	Commuting	1
22:41	Not seen – nr TN10	Soprano pipistrelle	Foraging	1
22:42	Not seen – nr TN10	Daubenton's	Commuting	2
22:45	TN11	Common pipistrelle	Commuting	1
22:47	TN12 – Not seen	Common pipistrelle	Foraging	1
22:49	TN12 – Not seen	Soprano pipistrelle	Commuting	1
22:51	TN13 – Not seen	Common pipistrelle	Foraging	1
22:52	TN13 – Not seen	Natterer's	Commuting	1
22:56	TN13 – Not seen	Daubenton's	Commuting	1
22:58	TN14 – Not seen	Soprano pipistrelle	Foraging	1
23:18	TN15 – Not seen	Daubenton's	Foraging	1
23:21	TN16 – Not seen	Common pipistrelle	Foraging	1
23:24	TN17 – Not seen	Soprano pipistrelle	Foraging	1
23:27	TN18	Common pipistrelle	Foraging	1
23:29	Near TN18	Daubenton's	Foraging	1

23:31	TN19	Soprano pipistrelle	Foraging	1

Objective Evidence of Species e.g. Sonograms

Analysed by JRD using Batsound November 2008

Additional Comments / Observations

DUSK SURVEY	**Recorder(s):** Gareth Parkinson(GJP) and Eleanor Liddle (EL)
Date:	23/09/08
Arrival time:	18.50*
Departure time:	21.00

Qualifications, Experience and Relevant Licenses:
GP – Two years bat surveying experience
EL – One month bat surveying experience

Site: Transect 2

Project and Reference:
Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	N/A	**Sunset:**	19.05
Wind speed:	Calm	**Air temperature (C):**	13°C

Weather (rain etc): Light drizzle

Habitat / corridors / nearby water bodies and general habitat:

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
19.35	TN1 Foraging over field	Soprano pipistrelle	Foraging	1
19.40	TN2	Common pipistrelle	Foraging	1
19.41	TN3	Common pipistrelle	Foraging	1
19.43	TN4	Soprano pipistrelle	Foraging	1
19.44	TN5	Common pipistrelle	Foraging	1
19.50	TN6	Common pipistrelle	Foraging	1
19.53	TN7	Soprano pipistrelle	Foraging	1
19.55	TN8	Common pipistrelle	Foraging	1
19.55	TN9	Common pipistrelle	Foraging	1
19.56	TN10	Soprano pipistrelle	Foraging	1
20.00	TN11	Common pipistrelle	Foraging	1
20.05	TN12	Common pipistrelle	Foraging	1
20.07	TN13	Common pipistrelle	Foraging	1
20.20	TN14	Common pipistrelle	Foraging	1
20.23	TN15	Common pipistrelle	Foraging	1
20.35	TN16	Common pipistrelle	Foraging	1
20.55	TN17	Soprano pipistrelle	Foraging	1
21.03	TN18	Soprano pipistrelle	Foraging	1

Objective Evidence of Species e.g. Sonograms

Calls analysed by JRD using Batsound on 24/11/08

Additional Comments / Observations

* Started survey late due to downpour of rain just as survey was due to start.

DUSK SURVEY	**Recorder(s):** Jennifer Davis (JRD) and Emma Grubb (EG)
Date:	31/07/08
Arrival time:	21.15
Departure time:	00.15

Qualifications, Experience and Relevant Licenses:
JRD: 4 years bat surveying experience
EG: Two months surveying with FM, BCT Intro to Bats training (April), WYBG Bat Care and Roost Visitor training (July)

Site: Transect 3

Project and Reference: Morpeth Northern Bypass/53101ILEE -

Weather conditions			
Sunrise:	05.12	**Sunset:**	21.12
Wind speed	0mph	**Air temperature (C)**	15.5

Weather (rain etc): Been raining throughout day, both drizzle and heavy. Evening damp and muggy but no rain. Lots of insects.

Habitat / corridors / nearby water bodies and general habitat:
Small watercourse, lined by trees and rough grassland either side. Arable fields with stubble, Howburn Wood to south

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
21.20	TN1 - Down watercourse	Noctule	Foraging for 5 minutes	1
21.40	TN2 - Up and down watercourse before heading to hedge	Soprano pipistrelle	Foraging	2
21.46	TN3 - Along watercourse	Soprano and Common pipistrelle	Foraging	2
22.00	TN4 - Along watercourse	Common pipistrelle	Foraging	2 – constant
22.16	TN5 - Along watercourse at stopping place (on bypass footprint)	Soprano and Common pipistrelle	Foraging	2 – few times
22.25	TN6 - Circling around corner	Common pipistrelle	Foraging	1
22.36	TN7 - Foraging along hedge	Common pipistrelle	Foraging	1
22.50	TN8 - Bats heard at once but not seen	Soprano and Common pipistrelle	Foraging	2`+
22.57	TN9 - Not seen	Soprano and Common pipistrelle	Foraging	1
23.21	TN10 - Not seen	Common pipistrelle	Foraging	
23.35	TN11 - Not seen	Common pipistrelle	Commuting	1
23.39	TN12 - Not seen	Common pipistrelle	Commuting	1
23.41	TN13 - Not seen	Common pipistrelle	Commuting	1
00.01	TN14 - Not seen	Common pipistrelle	Commuting	1

Objective Evidence of Species e.g. Sonograms

Analysed by JRD using Batsound November 2008

Additional Comments / Observations

DUSK SURVEY	**Recorder(s):** Jennifer Davis (JRD) and Emily Godsiffe (Emily G)
Date:	24/09/08
Arrival time:	18.45*
Departure time:	21.23

Qualifications, Experience and Relevant Licenses:
Jennifer - Four years bat survey experience Emily – One month bat survey experience

Site: Transect 3

Project and Reference:
Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	NA	**Sunset:**	19.03
Wind speed:	Calm, very slight breeze	**Air temperature (C):**	10°C

Weather (rain etc): 100% cloud, slight breeze, been cloudy day

Habitat / corridors / nearby water bodies and general habitat:
Watercourse, broadleaf woodland, open pasture.

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
19.28	TN1 - Not seen	Soprano pipistrelle	Commuting	1
19.28	TN1 - Not seen	Daubenton's	Commuting	1
19.27	TN2 - Watercourse	Common pipistrelle	Commuting	1
19.40	TN3 - Watercourse	Daubenton's	Commuting	1
19.40	TN3 - Watercourse	Common pipistrelle	Commuting	1
19.47	TN4 - Watercourse	Common pipistrelle	Foraging	1
19.47	TN4 - Watercourse	Daubenton's	Commuting	1
19.52	TN5 - Semi improved grassland (Stopping point)	Soprano pipistrelle and Daubenton's also foraging up and down stream	Foraging	2
20.01	TN5 - Semi improved grassland (Stopping point)	Common pipistrelle	Commuting	1
20.02	TN5	Soprano pipistrelle	Commuting	1
20.21	TN6	Daubtenton's	Foraging	1
20.23	TN6	Common pipistrelle	Commuting	1
20.24	TN6	Common pipistrelle	Commuting	1
20.29	TN7 - Not seen	Common pipistrelle	Foraging	1
20.30	TN8 - Not seen, may be a distance away, sounds quiet	Common pipistrelle and Daubenton's passed over	Foraging	2
20.44	TN9 - Double wire fencing with new planting	Common pipistrelle	Commuting	1
21.06	TN10 - Not seen/very faint	Common pipistrelle	Commuting	1
21.08	TN11 - Not seen/possibly by watercourse	Soprano pipistrelle	Commuting	1

Objective Evidence of Species e.g. Sonograms

Analysed by JRD using Batsound November 2008

Additional Comments / Observations

*Started survey late due to downpour of rain just as survey was due to start.

DUSK SURVEY	**Recorder(s):** Sarah Dale (SD) and Simon Armistead (SA)
Date:	31/07/08
Arrival time:	21:32
Departure time:	23:05

Qualifications, Experience and Relevant Licenses:
SD: 2 years bat surveying experience
SA: 2 previous surveys

Site: Transect 4

Project and Reference: Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	N/A	**Sunset:**	21:15
Wind speed :	Calm	**Air temperature (C):**	15.5°C

Weather (rain etc): Heavy showers up to 1 hour previous, light rain during survey easing off by end.

Habitat / corridors / nearby water bodies and general habitat:
No buildings in immediate area. Woodland to south. Small ponds in Howburn Wood near start of transect. Mainly fences rather than hedgerows. Sheep grazed pasture on hillside.

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
21:46	TN1 – not seen	Noctule	Foraging	1
21:49	TN2 – not seen	Common pipistrelle	Foraging	1
21:52	TN3 – seen	Common pipistrelle	Foraging	1
21:56	TN4 – not seen	Common pipistrelle	Foraging	1
22:00	TN5 – not seen	Common pipistrelle	Foraging	1
22:07	TN6 – seen	Common pipistrelle	Foraging	1
22:13	TN7 – not seen	Common pipistrelle	Foraging	1
22:16	TN8 – not seen	Soprano pipistrelle	Foraging	1
22:17	TN9 -seen	Common pipistrelle	Foraging	1
22:28	TN10 - seen	Common pipistrelle	Foraging	1
22:30	Near TN10 - seen	Soprano pipistrelle	Foraging	1
22:36	TN11 - seen	Common pipistrelle	Foraging	1
22:39	TN12	Soprano pipistrelle	Foraging	1
22:42	TN13	Common pipistrelle	Foraging	1
23:01	TN14	Common pipistrelle	Foraging	1

Objective Evidence of Species e.g. Sonograms

Analysed by JRD using Batsound November 2008

Additional Comments / Observations

DUSK SURVEY	**Recorder(s):** Jenna McGuiness (JM) and Rebecca Barker (RB)
Date:	23/09/08
Arrival time:	19.00*
Departure time:	21.08

Qualifications, Experience and Relevant Licenses:
RB - Bat Surveys: a Foundation Course For Consultants' (BCT Sept 2007)
2 years experience of bat surveys.
JM – Three surveys

Site: Transect 4

Project and Reference:
Morpeth Northern Bypass/53101IIEE

Weather conditions			
Sunrise:	N/A	**Sunset:**	19.05
Wind speed:	Slight wind	**Air temperature (C):**	10.5°

Weather (rain etc): Damp, 100% cloud cover

Habitat / corridors / nearby water bodies and general habitat:
Improved grassland , Howburn Wood to south with watercourse running through.

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
19.40	TN1	Daubenton's	Commuting	1
19.45	TN1	Common pipistrelle	Foraging	1
20.00	TN2 – Not seen	Common pipistrelle	Foraging	1
20.10	TN3	Common pipistrelle	Commuting	6
20.15	TN4	Common pipistrelle	Commuting	1
20.15	TN5	Common pipistrelle	Commuting	1
20.17	TN6	Soprano pipistrelle	Foraging	1
20.20	TN7	Common pipistrelle	Commuting	1
20.30	TN8	Common pipistrelle	Commuting	1
20.45	TN9	Common pipistrelle	Commuting	1
20.50	TN10	Common pipistrelle	Commuting	1

Objective Evidence of Species e.g. Sonograms

Calls analysed by JRD using Batsound on 24/11/08

Additional Comments / Observations

* Started survey late due to downpour of rain just as survey was due to start.

DUSK SURVEY	**Recorder(s):** Victoria Bennett (VB) and Jenna McGuiness (JM)
Date:	31/07/08
Arrival time:	21.15
Departure time:	23.15

Qualifications, Experience and Relevant Licenses: Vicki – Two years bat survey experience (mainly in Scotland)
Jenna - Assistant

Site: Transect 5

Project and Reference: Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	N/A	**Sunset:**	21:15
Wind speed:	Calm	**Air temperature (C):**	15.5°C

Weather (rain etc): Been raining throughout day, both drizzle and heavy. Evening damp and muggy but no rain. Lots of insects.

Habitat / corridors / nearby water bodies and general habitat:
Grassland, Howburn Wood to west, newly planted hedgerows/trees

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
21.45	TN1 - Woodland edge	Soprano pipistrelle	Commuting	2
21.48	TN1 - Woodland edge	Soprano pipistrelle	Commuting	1
21.50	TN2 - Woodland edge	Common pipistrelle	Commuting	1
21.54	TN2 - Woodland edge	Daubenton's	Commuting	2
21.56	TN2 - Woodland edge	Soprano pipistrelle	Commuting	1
21.58	TN3 - Woodland edge	Soprano and Common pipistrelle	Commuting	2 x Sop 2 x Comm
22.02	TN3 - Woodland edge	Common pipistrelle	Commuting	1
22.04	TN3 - Woodland edge	Soprano pipistrelle	Commuting	1
22.06	TN3 - Woodland edge	Common pipistrelle	Commuting	1
22.08	TN4 - Woodland edge	Daubenton's	Commuting	1
22.11	TN5 - Woodland edge	Common and Soprano pipistrelle	Commuting	1 x Sop 1 x Comm
22.14	TN6 - Over woodland	Daubenton's	Commuting	2
22.16	TN7 - Woodland edge	Soprano pipistrelle	Commuting and foraging	4
22.17	TN7 - Woodland edge	Soprano pipistrelle	Commuting	1
22.20	TN8 - Woodland edge	Soprano pipistrelle	Commuting	1
22.24	TN8 - Woodland edge	Common pipistrelle	Commuting	2
22.28	TN9 - Woodland/fence line	Daubenton's and Soprano pipistrelle	Commuting	1 x Daub 1 x Sop
22.30	TN9 - Woodland / fence line	Noctule	Commuting	1
22.36	TN9 - Woodland / fence line	Soprano pipistrelle	Commuting	1
22.52	TN10 - Road/hedge/field	Common pipistrelle	Commuting	2
22.54	TN10 - Road/hedge/field	Common pipistrelle	Commuting	1
23.04	TN11 - Road/hedge/field	Daubenton's and Soprano pipistrelle	Commuting and foraging	4 x Sop 1 x Daub
23.06	TN11 - Road/hedge/field	Soprano and Common pipistrelle	Commuting	3 x Sop 1 x Comm
23.12	TN12 - Road/hedge/field	Common pipistrelle	Commuting	1

Objective Evidence of Species e.g. Sonograms

Analysed by Victoria Bennett using Batsound November 2008

Additional Comments / Observations

DUSK SURVEY	**Recorder(s):** Gareth Parkinson (GJP) and Eleanor Liddle (EL)
Date:	24/09/08
Arrival time:	18.30
Departure time:	20.45

Qualifications, Experience and Relevant Licenses:
GP – Two years bat surveying experience
EL – One month bat surveying experience

Site: Transect 5

Project and Reference:
Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	N/A	**Sunset:**	19.02
Wind speed:	Light breeze, 5mph	**Air temperature (C):**	10°C

Weather (rain etc): Dry but overcast

Habitat / corridors / nearby water bodies and general habitat:
Improved grassland with Howburn Wood to west

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
19.13	TN1	Noctule	Commuting	1
19.16	TN2	Noctule	Commuting	1
19.31	TN3	Whiskered/Brandt's	Foraging	1
19.35	TN4	Soprano pipistrelle	Commuting	1
19.35	TN4	Daubenton's	Commuting	
19.36	TN5	Soprano pipistrelle	Commuting	
19.37	TN6	Daubenton's		
19.39	TN7 – Stopping point 1	Common pipistrelle	Foraging	1
19.40	TN7 - Stopping point 1	Daubenton's	Commuting	1
19.42	TN7 - Stopping point 1	Soprano pipistrelle	Commuting	1
19.46	TN8	Whiskered/Brandt's	Commuting	1
20.12	TN9	Soprano pipistrelle	Foraging	1
20.14	TN10	Soprano pipistrelle	Foraging	1
20.37	TN11	Noctule	Commuting	1

Objective Evidence of Species e.g. Sonograms

Analysed by JRD using Batsound November 2008

Additional Comments / Observations

Buildings

DAWN SURVEY	**Recorder(s):** Jennifer Davis (JRD)
Date:	31/07/08
Arrival time:	03.55
Departure time:	05.16

Qualifications, Experience and Relevant Licenses:

Four years bat surveying experience

Site: East Shield Hill – North

Project and Reference: - Morpeth Northern Bypass 53101ILEE

Weather conditions			
Sunrise:	05.14	**Sunset:**	21.21
Wind speed:	Calm	**Air temperature (C):**	15°C

Weather (rain etc): Calm, clear morning. 40% cloud cover, slight mist

Habitat / corridors / nearby water bodies and general habitat:
Numerous redbrick houses with tiled roofs, some stone buildings with slate roofs. All appear to be in good condition. Well maintained gardens. Watercourse to the east, including strip of woodland.

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
04.01	TN1 - Around rear of house	Common pipistrelle	Foraging	1
04.08	TN2 - Up and down driveway, feeding for ages	Common and soprano pipistrelle	Foraging	2 continuous
04.16	TN3 - Heard but not seen	Noctule	Foraging	1
04.17	TN3 - Heard not seen	Soprano pipistrelle	Commuting	1
04.18	TN3 - Heard not seen	Common pipistrelle	Commuting	1
04.19	TN3 - Heard not seen	Noctule	Commuting	1
04.20	TN3 - Heard not seen	Soprano pipistrelle	Commuting	1
04.23	TN3 - Heard not seen	Common pipistrelle	Commuting	1
04.27	TN3 - Heard not seen	Daubenton's	Commuting	1
04.29	TN3 - Heard not seen	Noctule/Leisler's	Commuting	1
04.30	TN3 - Heard not seen	Common pipistrelle	Commuting	1
04.38	TN3 - Heard not seen	Noctule/Leisler's	Commuting	1
04.44	TN4 - Behind far house and foraging over field	Noctule/Leisler's	Foraging	2

Objective Evidence of Species e.g. Sonograms

Analysed by JRD using Batsound November 2008

Additional Comments / Observations

No roost identified.

DAWN SURVEY	**Recorder(s):** Emma Grubb (EG)
Date:	30/07/08
Arrival time:	03.54
Departure time:	05.16

Qualifications, Experience and Relevant Licenses: Two months surveying with FM, BCT Intro to Bats training (April), WYBG Bat Care and Roost Visitor training (July)

Site: East Shield Hill North

Project and Reference: - Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	05.14	**Sunset:**	N/A
Wind speed:	0 – No breeze	**Air temperature (C):**	15°C

Weather (rain etc): Calm, clear morning. 40% cloud, slight mist

Habitat / corridors / nearby water bodies and general habitat:
Fairly modern stone built properties with large gardens, tarmac drive with hedgerow, watercourse in valley lined with mature trees and grassland, leading to mature woodland.

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
03.54	TN1 Flying from field over building	Common pipistrelle	Commuting	1
04.09	TN2 Along side of building into garden	Soprano pipistrelle	Commuting	1
04.11	TN3 Not seen	Common pipistrelle	Commuting	1
04.14	TN4 From garden area to over building	Common pipistrelle	Commuting	1
04.16	TN5 Not seen	Noctule	Foraging	1
04.19	TN6 From field to garden area with trees	Noctule	Commuting	1
04.22	TN7 Not seen	Common pipistrelle	Commuting	1
04.30	TN8 Flying high; tree height over watercourse	Noctule/Leisler's	Foraging	1
04.38	TN9 – Flying high, over watercourse and buildings	Noctule/Leisler's	Foraging	3
04.45	TN10 - As 9	Noctule/Leisler's	Foraging	4
04.48	TN11- As 9	Noctule/Leisler's	Foraging	2
04.49	TN12 -As 9	Noctule/Leisler's	Foraging	2
04.52	TN13 As 9	Noctule/Leisler's	Foraging	1
04.59	TN14 – Over building	Common pipistrelle	Commuting	1

Objective Evidence of Species e.g. Sonograms

Analysed recording by JRD on other side of building, November 2008.

Additional Comments / Observations

No roost identified. It was thought that the noctule/Leisler's might be roosting within Howburn Wood.

DUSK SURVEY	**Recorder(s):** Drew Constable (DC)
Date:	24/09/08
Arrival time:	18.40
Departure time:	21.03

Qualifications, Experience and Relevant Licenses:
4 months bat experience (including training / work with Wildlife Trust)

Site: East Shield Hill North

Project and Reference:
Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	N/A	**Sunset:**	19.03
Wind speed:	Calm	**Air temperature (C):**	10°C

Weather (rain etc): Fine, no rain, mild

Habitat / corridors / nearby water bodies and general habitat:
Fairly modern stone built properties with large gardens, tarmac drive with hedgerow, watercourse in valley lined with mature trees and grassland, leading to mature woodland.

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
19.03-23	TN1	Noctule	Commuting	1
19.26	TN2 - Bat seen flying over buildings	Common pipistrelle	Commuting	1
19.28	TN1 - Short, faint (not seen)	Common pipistrelle	Commuting	1
19.30	TN1 - Quick and short (not seen)	Common pipistrelle	Commuting + social calls	1
19.34	TN1 - Not seen	Common pipistrelle	Commuting	1
19.36	TN1 - Quick/short (Not seen)	Common pipistrelle	Commuting	1
19.40	TN1 - (not seen)	Common pipistrelle	Commuting	1
19.50	TN1 - (not seen)	Common pipistrelle	Commuting	1
19.57	TN1 - (not seen)	Common pipistrelle	Commuting	2
20.07	TN3 - (not seen)	Common pipistrelle	Commuting	1
20.13	TN3 - (not seen)	Common pipistrelle	Commuting	1
20.20	TN4 - By tree line (not seen) Howburn House	Common pipistrelle	Commuting	
20.25	TN1 - Not seen	Soprano pipistrelle	Social calls	2
20.30	TN1 - On road between houses and watercourse (not seen)	Soprano pipistrelle	Foraging/social	1
20.42	TN1 - Walking by tree line away from houses	Soprano pipistrelle	Commuting/social	1
20.44	TN1 - Walking by tree line away from houses	Soprano pipistrelle	Commuting/social	1
20.54 – 21.03	Intermittent until end of recording	Soprano pipistrelle	Foraging/social	1

Objective Evidence of Species e.g. Sonograms

Recording analysed by JRD using Batsound, November 2008

Additional Comments / Observations

Resident at 'The Granary' said she had bats (possibly pips) roosting in her house and has had them flying around her house.

Bat dropping found on wall of property fronting watercourse

Lots of social calls.

DUSK SURVEY	**Recorder(s):** Mark Wingrove (MW)	**Qualifications, Experience and Relevant Licenses:** 2 years bat surveying experience
Date:	24/09/08	
Arrival time:	18.40	**Site**: East Shield Hill North
Departure time:	21.03	**Project and Reference:** Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	N/A	**Sunset:**	19.03
Wind speed:	Calm	**Air temperature (C):**	10°C

Weather (rain etc): Fine, no rain, mild

Habitat / corridors / nearby water bodies and general habitat:
Fairly modern stone built properties with large gardens, tarmac drive with hedgerow, watercourse in valley lined with mature trees and grassland, leading to mature woodland.

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
19.26	TN1 - Rear driveway of cottages – prob emerged already	Noctule	Commuting	1
19.32	TN1 - Along rear driveway	Soprano pipistrelle	Commuting	1
19.35-19.40	TN2 - Briefly seen in rear gardens. Seen along driveway	Common pipistrelle	Commuting	1
20.06	TN3 - Near plantation/bridge	Soprano pipistrelle	Foraging + social calls	?
20.20	TN2 - Along rear driveway	Common pipistrelle	Commuting	1
20.28	TN3 - Near plantation/bridge	Soprano and common pipistrelle	Foraging and social calls	2
20.34-21.02	TN4 - Around houses and bridge/intermittent activity	Soprano pipistrelle	Foraging and social calls	1

Objective Evidence of Species e.g. Sonograms

Recording analysed by JRD using Batsound, November 2008

Additional Comments / Observations

DAWN SURVEY	**Recorder(s):** Sarah Dale (SD)
Date:	31/07/08
Arrival time:	03:50
Departure time:	05:15

Qualifications, Experience and Relevant Licenses: 2 years bat surveying in South West

Site: East Shield Hill - South

Project and Reference: Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	05:12	**Sunset:**	N/A
Wind speed:	Calm	**Air temperature (C):**	15°C

Weather (rain etc): No recent rain

Habitat / corridors / nearby water bodies and general habitat:
Good hedgerows
Stream nearby
Main house and small outbuildings, new cottages nearby
Small patch of woodland in the grounds
Next to open agricultural fields

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
03:54	TN1 - not seen	Common pipistrelle	Foraging	1
03:57	TN1 - not seen	Common pipistrelle	Foraging	1
04:01	TN1 - not seen	Common pipistrelle	Foraging	1
04:04	TN2	Common pipistrelle	Foraging	1
04:07-04:09	Not seen	Noctule	Foraging	1
04:08	TN1	Common pipistrelle	Foraging	1
04:11	TN1	Noctule	Commuting	1
04:12	TN1	Common pipistrelle	Foraging	1
04:14	TN3	Soprano pipistrelle	Commuting	1
04:15	TN3	Common pipistrelle	Foraging	1
04:16	TN3	Common pipistrelle	Foraging	1
04:18	TN4	Common pipistrelle	Foraging	1
04:21	TN5	Soprano pipistrelle	Foraging	1
04:21	TN6	Common pipistrelle	Foraging	1
04:23	TN3	Common pipistrelle	Commuting	1
04:24	TN6	Common pipistrelle	Foraging	1
04:25	TN7 – seen fly South	Common pipistrelle	Foraging	2
04:28	TN6	Common pipistrelle	Foraging	1
04:29	TN3	Daubenton's	Commuting	1
04:30	TN8	Bat seen fly over house not calling (looked like pip)	Commuting	1
04:32 – 04:57	TN6 – seen feeding on corner of house, gleaning insects off ivy, not always calling	Common pipistrelle	Foraging	2+
04:54	TN9	Large bat (not echolocating) thought to go under ivy under eaves at SW corner of house		

Objective Evidence of Species e.g. Sonograms

JRD analysed recording using Batsound November 2008

Additional Comments / Observations

Bats generally observed circling garden, particularly on SW corner of house. Flying over coniferous hedge/around shrubs.

Bat roost identified but species unknown.

DAWN SURVEY	**Recorder(s):** Simon Armistead (SA)
Date:	31/07/08
Arrival time:	03:52
Departure time:	05:15

Qualifications, Experience and Relevant Licenses:

2 previous surveys (assistant)

Site: East Shield Hill - south

Project and Reference: Morpeth Bypass

Weather conditions			
Sunrise:	05:12	**Sunset:**	N/A
Wind speed:		**Air temperature (C):**	15°C

Weather (rain etc): No recent rain

Habitat / corridors / nearby water bodies and general habitat:
Good hedgerows
Stream nearby
Main house and small outbuildings, new cottages nearby
Small patch of woodland in the grounds
Next to open agricultural fields

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
03:52	TN1 – not seen	Common pipistrelle	Commuting	1
03:57	TN2	Soprano pipistrelle	Commuting	1
03:59	TN3	Common pipistrelle	Foraging	1
04:02	TN3	Common pipistrelle	Commuting	1
04:07	Nr TN3 – not seen	Soprano pipistrelle	Commuting	1
04:10	Nr TN3 – not seen	Common pipistrelle	Commuting	1
04:14	TN5	Common pipistrelle	Commuting	1
04:21	TN6 – Flew over house	Common pipistrelle	Commuting	1
04:27	Near TN5	Daubenton's	Commuting	1
04:32	Circled garden over coniferous hedgerow	Soprano pipistrelle	Commuting	1
04:36	Circling garden over house	Soprano pipistrelle	Commuting	1

Objective Evidence of Species e.g. Sonograms

JRD analysed recording from other side of the house using Batsound November 2008

Additional Comments / Observations

No roost identified.

DAWN SURVEY	**Recorder(s):** Jennifer Davis (JRD)
Date:	25/09/08
Arrival time:	05.26
Departure time:	06.51

Qualifications, Experience and Relevant Licenses: Four years bat surveying experience

Site: East Shield Hill South

Project and Reference: Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	06.56	**Sunset:**	N/A
Wind speed	Calm	**Air temperature (C):**	10°c

Weather (rain etc): 100% cloud. Feels fairly mild and no wind or rain

Habitat / corridors / nearby water bodies and general habitat:
How Burn to the west, SI grassland to the south, some mature trees within the garden.

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
05.35	TN1 - Not seen – very quiet and brief	Soprano pipistrelle	Commuting	1
05.37	TN1 - Not seen	Noctule	Commuting	
05.42	TN2 - Not seen	Common pipistrelle	Commuting	1
05.47	TN2 - Not seen	Common pipistrelle	Commuting	1
05.55	TN3	Soprano pipistrelle	Social calls	1
06.03	TN3	Soprano pipistrelle	Social calls	1
06.10	TN4	Soprano pipistrelle	Commuting	1
06.17	TN5	Noctule	Commuting	1
06.27	TN6	Soprano pipistrelle	Commuting	1

Objective Evidence of Species e.g. Sonograms

Bat calls analysed by JRD using Batsound, November 2008

Additional Comments / Observations

Surveyor stood on south-eastern corner of the building.
No roost found on this side of the building.

DAWN SURVEY	**Recorder(s):** Emily Godsiffe (Emily G)
Date:	25/09/08
Arrival time:	05.26
Departure time:	06.51

Qualifications, Experience and Relevant Licenses:
One month bat survey experience

Site: East Shield Hill South

Project and Reference:
Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	06.56	**Sunset:**	N/A
Wind speed	Calm	**Air temperature (C):**	10°C

Weather (rain etc): 100% cloud. Feels fairly mild and no wind or rain

Habitat / corridors / nearby water bodies and general habitat:
How Burn to the west, SI grassland to the south, some mature trees within the garden.

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
05.35	Not seen	Soprano pipistrelle	Very faint	2+
05.37	Not seen	Noctule	Very faint	1
05.40	Not seen	Soprano pipistrelle	Very faint	1
05.50	Not seen	Soprano pipistrelle	Very faint	1
06.15	Not seen	Soprano pipistrelle	Very faint	1
06.35	TN1 – End wall and roof	Not detected	Landed on building/roost	1

Objective Evidence of Species e.g. Sonograms

Additional Comments / Observations

Surveyor stood on north-western corner of the building.
Roost found between the end wall and the roof, on the northerly aspect.

DAWN SURVEY	**Recorder(s):** Jenna McGuinness (JM) and Rebecca Barker (RB)
Date:	24/09/08
Arrival time:	05.20
Departure time:	07.00

Qualifications, Experience and Relevant Licenses:
RB - Bat Surveys: a Foundation Course For Consultants' (BCT Sept 2007)
2 years experience of bat surveys.
JM – Three surveys

Site: Buildings to north of East Lane End

Project and Reference:
Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	06.50	**Sunset:**	N/A
Wind speed:	Calm	**Air temperature (C):**	9.5°C

Weather (rain etc): Dry, overcast

Habitat / corridors / nearby water bodies and general habitat:
Open fields to the north with hedgerows defining boundaries. one red brick building with slate roof (residential), one white-wash building with slate roof (residential), one wooden shed/garage with a corrugated roof.

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
06.05	Hedged path	Noctule	Commuting	1
06.05	Hedged path	Noctule	Commuting	1

Objective Evidence of Species e.g. Sonograms

Bat calls analysed by JRD using Batsound, November 2008

Additional Comments / Observations

No bat roost identified.

DAWN SURVEY	**Recorder(s):** Eleanor Liddle (EL)
Date:	24/09/08
Arrival time:	05.20
Departure time:	07.00

Qualifications, Experience and Relevant Licenses:
One month bat survey experience

Site: East Lane End

Project and Reference:
Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	06.50	**Sunset:**	N/A
Wind speed:	Calm	**Air temperature (C):**	12.5°C

Weather (rain etc): Dry, overcast

Habitat / corridors / nearby water bodies and general habitat:

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
05.37	TN1 - Tree near entrance	Soprano pipistrelle	Commuting	1
05.40	TN2 - Tree near entrance	Common pipistrelle	Commuting	1
05.52	TN3 - Near building on access track	Common pipistrelle	Commuting	1
05.54	TN4 - Near 1 / 2	Soprano pipistrelle	Commuting	1
05.57	TN5 - Near 1 / 2	Soprano pipistrelle	Commuting	1
06.08	TN6 - Near ½	Soprano pipistrelle	Commuting	1
06.15	TN7 - Behind hay barns	Common pipistrelle	Foraging	1
06.42	Near trees on access track	Common pipistrelle	Commuting	1

Objective Evidence of Species e.g. Sonograms

JRD analysed bat calls from the other surveyor from the site using Batsound, November 2008

Additional Comments / Observations

No roost identified.

DAWN SURVEY	**Recorder(s):** Gareth Parkinson (GJP)	**Qualifications, Experience and Relevant Licenses:** Two years bat survey experience
Date:	24/09/08	
Arrival time:	05.20	**Site**: East Lane End
Departure time:	07.00	**Project and Reference:** Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	06.50	**Sunset:**	N/A
Wind speed:	Calm	**Air temperature (C):**	12.5°C
Weather (rain etc): Dry, overcast			
Habitat / corridors / nearby water bodies and general habitat: A number of stone buildings; one main house, 7 barns and one outbuilding.			

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
05.50	TN1 - Heard, not seen	Common pipistrelle	Foraging	1
05.54	TN2 - Heard, not seen	Soprano pipistrelle	Foraging	1
06.07	TN3 - Heard, not seen	Common and soprano pipistrelle	Commuting	2
06.07	TN4 - Heard, not seen	Common pipistrelle	Commuting	1
06.11	TN5 - Heard, not seen	Common pipistrelle	Commuting	1
06.17	TN6 - -Heard, not seen	Common pipistrelle	Commuting	1
06.40	TN7 - Building 5	Common pipistrelle	Entering	1

Objective Evidence of Species e.g. Sonograms

JRD analysed bat calls using Batsound, November 2008

Additional Comments / Observations

Bat roost identified in one of the barns. Barn is stone built with slate roof and corrugated metal construction. Bat entered underneath the facia in the south-east aspect.

DAWN SURVEY	**Recorder(s):** Jennifer Davis (JRD)
Date:	24/09/08
Arrival time:	05.20
Departure time:	06.52

Qualifications, Experience and Relevant Licenses: Four years bat survey experience

Site: Rose Cottage

Project and Reference: Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	06.50	**Sunset:**	N/A
Wind speed:	Calm	**Air temperature (C):**	9°C

Weather (rain etc): Cloudy sky but no rain

Habitat / corridors / nearby water bodies and general habitat:
Hedgerow to west of property and pasture field beyond.

Time of sighting (24 hr clock)	**Feature of the building/structure and location of sighting**	**Bat species**	**Behaviour (e.g. foraging / commuting)**	**Number of Bats**
05.28	TN1 - Not seen. Social calls heard.	Soprano pipistrelle	Foraged for 1 minute	1
05.28	TN2 - Not seen	Soprano pipistrelle	Commuting	1
06.06	TN3 - Not seen	Soprano pipistrelle	Commuting	1
06.09	TN4 - Probably same bat, as previous. Sounds like commuting along hedge	Soprano pipistrelle	Commuting	1
06.18	TN5 - V. brief call, not seen	Soprano pipistrelle		1
06.23	TN6 - Not seen	Soprano pipistrelle	Commuting	1
06.32	TN7 - Flew over building	Soprano pipistrelle	Commuting	1
06.39	TN8 - Entered roost	Soprano pipistrelle	Entered roost	1

Objective Evidence of Species e.g. Sonograms

Bat calls analysed by JRD using Batsound, November 2008.

Additional Comments / Observations

Roost identified. Bat entered in the south-west corner of the building between facia and roof.

DAWN SURVEY	**Recorder(s):** Emily Godsiffe (Emily G)	**Qualifications, Experience and Relevant Licenses:** One month bat survey experience
Date:	24/09/08	
Arrival time:	05.20	**Site**: Rose Cottage
Departure time:	06.52	**Project and Reference**: Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	06.50	**Sunset:**	N/A
Wind speed:	Calm	**Air temperature (C):**	9°C

Weather (rain etc): Cloudy sky but no rain

Habitat / corridors / nearby water bodies and general habitat:
Hedgerow to west of property and pasture field beyond.

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
05.40	Not seen	Soprano pipistrelle	Commuting (faint)	1
06.00	Not seen	Soprano pipistrelle	Commuting (faint)	1
06.05	Not seen	Soprano pipistrelle	Foraging	1
06.14	Flying past building along line of road towards trees	Soprano pipistrelle	Commuting	1
06.21	Not seen	Soprano pipistrelle	Commuting	1
06.35	Not seen	Soprano pipistrelle	Commuting (faint)	1

Objective Evidence of Species e.g. Sonograms

Bat calls from the other side of the building analysed by JRD, November 2008

Additional Comments / Observations

No roost found on this side of the building.

DAWN SURVEY	**Recorder(s):** Jennifer Davis (JRD)
Date:	26/09/08
Arrival time:	05.28
Departure time:	07.00

Qualifications, Experience and Relevant Licenses:
Four years bat survey experience

Site: Kater Dene

Project and Reference:
Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	06.58	**Sunset:**	N/A
Wind speed:	Calm, slight breeze	**Air temperature (C):**	10°C

Weather (rain etc): 90% cloud cover, foggy

Habitat / corridors / nearby water bodies and general habitat:
Residential and farm buildings, lawn, pasture, immature trees

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
		NO BATS HEARD/SEEN		

Objective Evidence of Species e.g. Sonograms

Bat recording analysed using Batsound by JRD to confirm no bats heard.

Additional Comments / Observations

No bats heard.

DAWN SURVEY	**Recorder(s):** Emily Godsiffe (Emily G)
Date:	26/09/08
Arrival time:	05.28
Departure time:	07.00

Qualifications, Experience and Relevant Licenses: One month bat survey experience

Site: Kater Dene

Project and Reference: Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	06.58	**Sunset:**	N/A
Wind speed:	Calm, slight breeze	**Air temperature (C):**	10°C

Weather (rain etc): 90% cloud cover, foggy

Habitat / corridors / nearby water bodies and general habitat:
Residential and farm buildings, lawn, pasture, immature trees

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
		NO BATS HEARD/SEEN		

Objective Evidence of Species e.g. Sonograms

Bat recording from the other side of the building analysed using Batsound by JRD to confirm no bats heard.

Additional Comments / Observations

No bats heard.

DAWN SURVEY	**Recorder(s):** Gareth Parkinson (GJP)
Date:	26/09/08
Arrival time:	05.30
Departure time:	07.00

Qualifications, Experience and Relevant Licenses:
Two years bat survey experience

Site: West Lane End

Project and Reference:
Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	06.58	**Sunset:**	N/A
Wind speed:	Calm	**Air temperature (C):**	8°C

Weather (rain etc): Cool, misty

Habitat / corridors / nearby water bodies and general habitat:
Eight properties including one farmhouse, one garage, one shed, 3 barns and 4 outbuildings. Mixture of red-brick, stone and wooden construction, most with a slate roof. Bat potential identified. Set in improved grassland.

Time of sighting (24 hr clock)	**Feature of the building/structure and location of sighting**	**Bat species**	**Behaviour (e.g. foraging / commuting)**	**Number of Bats**
06.19	Not seen	Soprano pipistrelle	Foraging	1
06.38	Barn	Soprano pipistrelle	Entering roost	1

Objective Evidence of Species e.g. Sonograms

Bat calls analysed by JRD using Batsound, November 2008

Additional Comments / Observations

Bat roost identified. Bat entered a hole in the south-facing wall of a barn in the centre of the site.

DAWN SURVEY	**Recorder(s):** Eleanor Liddle (EL)
Date:	26/09/08
Arrival time:	05.30
Departure time:	07.00

Qualifications, Experience and Relevant Licenses: One month bat survey experience

Site: West Lane End

Project and Reference: Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	06.58	**Sunset:**	N/A
Wind speed:	Calm	**Air temperature (C):**	8°C

Weather (rain etc): Cool, misty

Habitat / corridors / nearby water bodies and general habitat:
Eight properties including one farmhouse, one garage, one shed, 3 barns and 4 outbuildings. Mixture of red-brick, stone and wooden construction, most with a slate roof. Bat potential identified. Set in improved grassland.

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
06.39	Barn	Soprano pipistrelle	Entering roost	1

Objective Evidence of Species e.g. Sonograms

Bat calls from the other surveyor analysed by JRD using Batsound, November 2008

Additional Comments / Observations

No roost found by this surveyor.

Trees

DAWN SURVEY	**Recorder(s):** Mark Wingrove (MW)
Date:	25/09/08
Arrival time:	05.09
Departure time:	07.15

Qualifications, Experience and Relevant Licenses:
2 years bat surveying experience

Site: Trees 1 and 2

Project and Reference:
Morpeth Northern Bypass/53101ILEE

Weather conditions			
Sunrise:	06.56	**Sunset:**	N/A
Wind speed:	Calm	**Air temperature (C):**	10°C

Weather (rain etc): Dry

Habitat / corridors / nearby water bodies and general habitat:
Woodland

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
05.30-5.45	In field	Daubenton's	Foraging	1
05.54	Tree 1 – feeding in woodland	Common pipistrelle	Foraging	1
05.56-06.03	Tree 1	Common pipistrelle	Foraging	2
06.12	Tree 2	Common pipistrelle	Commuting	1
06.16	Tree 2	Common pipistrelle	Commuting	1

Objective Evidence of Species e.g. Sonograms

Bat calls analysed by JRD using Batsound, November 2008

Additional Comments / Observations

Tawny owl seen.
No evidence of a bat roost seen.

DAWN SURVEY	**Recorder(s):** Drew Constable (DC)
Date:	25/09/08
Arrival time:	05.09
Departure time:	07.15

Qualifications, Experience and Relevant Licenses:
4 months bat experience (including training / work with Wildlife Trust

Site: Trees 1 and 2

Project and Reference:
Morpeth Northern Bypass, 53101ILEE

Weather conditions			
Sunrise:	06.56	**Sunset:**	N/A
Wind speed:	Calm	**Air temperature (C):**	10°C

Weather (rain etc): Dry

Habitat / corridors / nearby water bodies and general habitat:
Woodland

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
05.55	Nr. tree 2 – Feeding in woodland	Common pipistrelle	Foraging	1
06.07-06.14	Nr tree 2 – Feeding in woodland (intermittent activity)	Common pipistrelle	Foraging	1
06.17	Nr tree 1 – Flying over woodland	Common pipistrelle	Foraging	1
06.27	Nr tree 1 – flew from edge of woodland from tree side to main woodland body	No echolocation but thought to be a pipistrelle	Commuting	1
06.31	Nr tree 1 – flew past alder trees at edge of woodland out of sight	Common pipistrelle	Commuting	1

Objective Evidence of Species e.g. Sonograms

Bat calls analysed by JRD using Batsound, November 2008

Additional Comments / Observations

No evidence of a roost seen.

DAWN SURVEY	**Recorder(s):** Gareth Parkinson (GJP)
Date:	25/09/08
Arrival time:	05.30
Departure time:	06.55

Qualifications, Experience and Relevant Licenses:
Two years bat survey experience

Site: Trees 13 and 14

Project and Reference:
Morpeth Northern Bypass, 53101ILEE

Weather conditions			
Sunrise:	06.56	**Sunset:**	N/A
Wind speed:	Calm	**Air temperature (C):**	13°C

Weather (rain etc): Overcast but dry

Habitat / corridors / nearby water bodies and general habitat:
Trees in pasture with small watercourse, surrounded by arable fields with hedgerows. No. of large woodland.

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
05.14	Around trees 13 & 14	Common pipistrelle	Foraging	1
06.07	Around trees 13 & 14	Common pipistrelle	Social calls	1
06.09	Around trees 13 & 14	Common pipistrelle	Foraging	1
06.12	Around trees 13 & 14	Common pipistrelle	Foraging	1
06.13	Around trees 13 & 14	Soprano pipistrelle	Foraging	1
06.15	Around trees 13 & 14	Soprano pipistrelle	Foraging	1
06.16	Around trees 13 & 14	Noctule	Commuting	1
06.34	Around trees 13 & 14	Noctule	Commuting	1
06.36	Around trees 13 & 14	Noctule	Commuting	1
06.37	Around trees 13 & 14	Noctule	Commuting	1

Objective Evidence of Species e.g. Sonograms

Bat recordings analysed by JRD using Batsound, November 2008

Additional Comments / Observations

No bat roost identified.

DAWN SURVEY	**Recorder(s):** Eleanor Liddle (EL)
Date:	25/09/08
Arrival time:	05.30
Departure time:	06.55

Qualifications, Experience and Relevant Licenses:
1 month bat surveying

Site: Tree 15

Project and Reference:
Morpeth Northern Bypass, 53101ILEE

Weather conditions			
Sunrise:	06.56	**Sunset:**	N/A
Wind speed:	Calm	**Air temperature (C):**	13°C

Weather (rain etc): Overcast but dry

Habitat / corridors / nearby water bodies and general habitat:
Trees in pasture with small watercourse, surrounded by arable fields with hedgerows. No. of large woodland.

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
05.31	Nr tree 15	Common pipistrelle	Commuting	1
05.39-05.49	Nr tree 15	Soprano pipistrelle	Foraging	1
05.46	Nr tree 15	Common pipistrelle	Commuting	1
05.48	Nr tree 15	Common pipistrelle	Foraging	1
05.51	Nr tree 15	Soprano pipistrelle	Commuting	1
05.53	Nr tree 15	Soprano pipistrelle	Foraging	1
05.56	Nr tree 15	Soprano pipistrelle	Foraging	1
05.58	Nr tree 15	Daubenton's	Commuting	1
06.30	Nr tree 15	Common pipistrelle	Foraging	1
06.41	Nr tree 15	Common pipistrelle	Foraging	1

Objective Evidence of Species e.g. Sonograms

Bat recordings analysed by JRD using Batsound, November 2008

Additional Comments / Observations

No bat roost identified.

DUSK SURVEY	**Recorder(s):** Jennifer Davis (JRD) & Emily Godsiffe (EmG)
Date:	25/09/08
Arrival time:	18.40
Departure time:	20.29

Qualifications, Experience and Relevant Licenses:
JD – Four years bat surveying experience
Emily – One month experience

Site: Tree 17

Project and Reference:
Morpeth Northern Bypass, 53101ILEE

Weather conditions			
Sunrise:	N/A	**Sunset:**	19.00
Wind speed:	Calm, no wind at all	**Air temperature (C):**	15°C

Weather (rain etc): 5% cloud cover, calm evening. Been a warm and sunny day. Mist enveloped half way through survey.

Habitat / corridors / nearby water bodies and general habitat:
Trees on fenceline with arable and pasture fields adjacent.

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
19.36	Emerged out of tree	Soprano pipistrelle	Emerged	2
19.43	Not seen – sounded faint	Common pipistrelle	Commuting	1
19.47	Not seen but think was foraging up and down hedge	Soprano pipistrelle	Foraging	1
19.50	Feeding around tree and hedge	Common pipistrelle	Foraging	2
20.12	Near, but not seen	Pipistrelle sp.	Commuting	1
20.17	Near, but not seen	Daubenton's	Commuting	1
20.21	Near, but not seen	Common pipistrelle	Commuting	1
20.28	Not seen	Daubenton's	Commuting	1

Objective Evidence of Species e.g. Sonograms

Bat recordings analysed by JRD using Batsound, 27/11/08

Additional Comments / Observations

Bat roost found containing 2 soprano pipistrelle

DUSK SURVEY	**Recorder(s):** Mark Wingrove (MW) & Drew Constable (DC)	**Qualifications, Experience and Relevant Licenses:** MW – 2 years bat surveying experience DC - 4 months bat experience (including training / work with Wildlife Trust
Date:	26/09/08	
Arrival time:	05.15	**Site:** Tree 27
Departure time:	07.10	**Project and Reference:** Morpeth Northern Bypass, 53101ILEE

Weather conditions			
Sunrise:	06.58	**Sunset:**	
Wind speed:		**Air temperature (C):**	

Weather (rain etc): Dry but damp (misty). No rain.

Habitat / corridors / nearby water bodies and general habitat:

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
06.10	Flew along hedgeline	Common pipistrelle	Commuting	1
06.14	Faint/distant	Common pipistrelle	Commuting	1
06.21	Faint/short	Soprano pipistrelle	Commuting	1
06.23	Faint – flew over tress	Soprano pipistrelle	Commuting	1
06.26	Flew along hedgeline	Common pipistrelle	Commuting	1

Objective Evidence of Species e.g. Sonograms

Bat recordings analysed by JRD using Batsound, November 2008

Additional Comments / Observations

No bat roost identified.

DUSK SURVEY	**Recorder(s):** Gareth Parkinson (GJP) & Eleanor Liddle (EL)	**Qualifications, Experience and Relevant Licenses:** Gareth – Two years bat surveying experience Eleanor – One month bat surveying experience
Date:	25/09/08	
Arrival time:	18.30	**Site:** Tree 30
Departure time:	20.30	**Project and Reference:** Morpeth Northern Bypass, 53101ILEE

Weather conditions			
Sunrise:	N/A	**Sunset:**	18.55
Wind speed:	Calm	**Air temperature (C):**	16°C

Weather (rain etc): Overcast, dense fog/mist rising throughout survey

Habitat / corridors / nearby water bodies and general habitat:
Treeline/hedgerow, arable and improved grassland, small ditch to east.

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
19.37	Over fields	Noctule	Commuting	1
19.39	Over fields	Common pipistrelle	Foraging	1
19.45	Over fields	Soprano pipistrelle	Foraging	1
19.46	Over fields	Common pipistrelle	Foraging	1
19.47	Over fields	Common pipistrelle	Foraging	1
19.51	Over fields	Daubenton's	Foraging	1
19.52-20.03	Over improved grassland to south	Common pipistrelle	Foraging	1
20.00	Over improved grassland to south	Daubenton's	Foraging	1
20.01	Over improved grassland to south	Daubenton's	Foraging	1
20.10	Over improved grassland to south	Common pipistrelle	Foraging	1
20.13	Over improved grassland to south	Common pipistrelle	Foraging	1
20.16	Over improved grassland to south	Daubenton's	Foraging	1
20.27	Over improved grassland to south	Common pipistrelle	Foraging	1

Objective Evidence of Species e.g. Sonograms

Bat calls analysed by JRD using Batsound, November 2008

Additional Comments / Observations

No bat roost identified.

DUSK SURVEY	**Recorder(s):** Mark Wingrove (MW) & Drew Constable (DC)	**Qualifications, Experience and Relevant Licenses:** MW - 2 years bat surveying experience DC - 4 months bat experience (including training / work with Wildlife Trust
Date:	25/09/08	
Arrival time:	18.30	**Site:** Tree 35
Departure time:	20.40	**Project and Reference:** Morpeth Northern Bypass, 53101ILEE

Weather conditions			
Sunrise:	N/A	**Sunset:**	19.00
Wind speed:	0-1 Beaufort	**Air temperature (C):**	15°C
Weather (rain etc): Dry, calm, clear			
Habitat / corridors / nearby water bodies and general habitat:			

Time of sighting (24 hr clock)	Feature of the building/structure and location of sighting	Bat species	Behaviour (e.g. foraging / commuting)	Number of Bats
19.34	Not seen.	Noctule	Commuting	1
19.35 - 19.39	Flying around by house (Rose Cottage), came from behind to commute down road	Common pipistrelle	Commuting & social calls	1
19.39	Not seen	Soprano pipistrelle	Commuting	1
19.42	As above – flew back over heads towards hospital	Common pipistrelle	Commuting	1
19.42 - 20.11	Intermittent activity	Common pipistrelle	Foraging & social calls	1
19.43	Not seen	Noctule/Leisler's	Commuting	
20.14 - 20.16	Intermittent activity	Common pipistrelle	Foraging	1
20.19 -20.24	Intermittent activity	Common pipistrelle	Commuting & social calls	1
20.27 - 20.30	Intermittent activity	Common pipistrelle	Social calls	1

Objective Evidence of Species e.g. Sonograms

Bat calls analysed by JRD using Batsound, November 2008

Additional Comments / Observations

No roost identified.